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Association of kidney size and renal function decline in patients with IgA nephropathy

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Background/Aims: IgA nephropathy (IgAN) is the most common primary glomerulonephritis worldwide. However, identifying IgAN patients at higher risks for renal function decline is still a challenge. Recent investigations have proposed kidney size to be a risk factor for renal function decline in kidney transplantation recipients. Therefore, this study aimed to investigate whether kidney size has an effect on renal function deterioration rate in patients with IgAN. **Methods:** Retrospective analysis was preformed from electronic medical records of 516 biopsy-proven IgAN patients. Kidney length was considered as the longest longitudinal diameter from sonographic measurements obtained at the time of biopsy. The average length of both kidneys was divided by body mass index for each individual to make adjustments for subject size (BMI-adjusted kidney size). Renal outcome was defined as a composite of a ≥ 50% decline in estimated glomerular filtration rate (eGFR) from baseline or the onset of end-stage renal disease. **Results:** The mean age of the patients was 40.4 ± 12.1 years and 211 patients (40.9%) were male. The mean eGFR was 79.6 ± 28.3 mL/min/1.73 m2 and the average kidney length was 102.8 ± 8.8 mm at baseline. The median follow-up duration was 51 months. When the patients were grouped into tertiles based on BMI-adjusted kidney size, renal outcome occurred in 30 (17.0%), 25 (14.0%), and 12 (7.4%) patients in the 1st, 2nd, and 3rd tertile groups, respectively. Multivariate Cox proportional analysis revealed that the risk of renal outcome was significantly lower in the 3rd tertile group as compared to the 1st tertile group (hazard ratio [HR], 0.44; 95% confidence interval [CI], 0.21-0.93; P=0.031). Additionally, the risk of incident CKD significantly decreased as the BMI-adjusted kidney size increased (HR, 0.55; 95% CI, 0.36-0.86; P=0.008). These results remained robust even after adjustments were made for confounding factors including baseline eGFR and proteinuria. **Conclusions:** Small kidney size could be a risk factor for renal function decline in IgA nephropathy patients. Simple sonographic kidney size measurements may help stratifying progression risk in patients with IgA nephropathy.

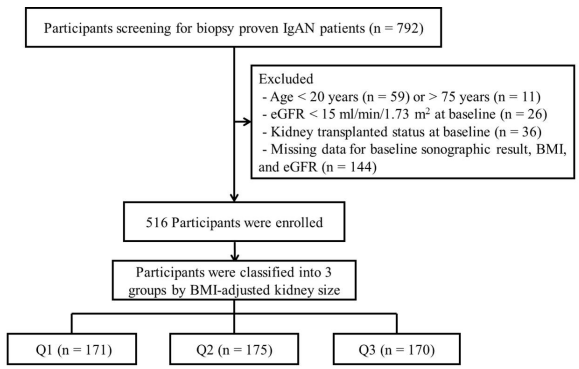

Figure 1. Flow chart of participants.

Table 4. Multivariate Cox proportional hazards regression analyses of the association of BMI-adjusted kidney size

Models	BMI-adjusted kidney size*	*P*	BMI-adjusted kidney size (vs. Q1)				
			Q1	Q2	*P*	Q3	*P*
	HR (95% CI)			HR (95% CI)		HR (95% CI)	
Model 1	0.55 (0.37 - 0.80)	0.002	Reference	0.72 (0.42 - 1.23)	0.229	0.40 (0.21 - 0.78)	0.007
Model 2	0.60 (0.40 - 0.90)	0.012		0.81 (0.46 - 1.42)	0.464	0.48 (0.24 - 0.97)	0.040
Model 3	0.54 (0.34 – 0.87)	0.011		0.69 (0.35 – 1.39)	0.303	0.97 (0.17 – 0.90)	0.027
Model 4	0.57 (0.35 - 0.93)	0.026		0.56 (0.27 - 1.17)	0.124	0.42 (0.18 - 0.99)	0.048

Note:
* BMI-adjusted kidney size is continuous variable.
Model 1: Unadjusted.
Model 2: Adjusted for age, sex.
Model 3: Model 2 + hypertension, diabetes, systolic blood pressure, hemoglobin, albumin, uric acid, triglyceride.
Model 4: Model 3 + UPCR, eGFR, and pathology finding.

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Hyperuricemia is associated with acute kidney injury and all-cause mortality in hospitalized patient

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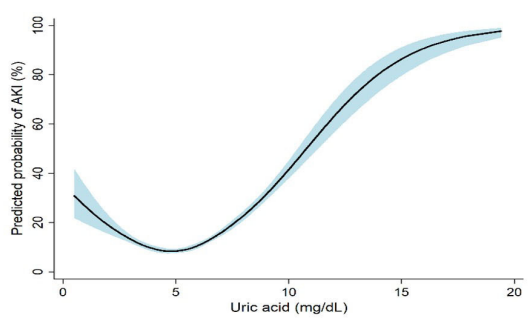
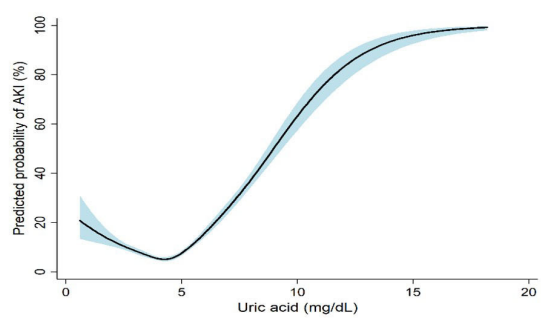
Background/Aims: Hyperuricemia as a risk factor of high morbidity and mortality has been documented in several disease status. Nevertheless, the relationship between uric acid (UA) and the risks of acute kidney injury (AKI) and mortality remains unresolved in hospitalized patients. **Methods:** All patients (aged ≥ 17 years old) admitted to Seoul National University Bundang Hospital from January 2013 to December 2013 were retrospectively reviewed. UA at the time of admission was categorized based on the quartiles. Odds ratio (OR) for AKI and hazard ratio (HR) for all-cause mortality were calculated after adjustment of multiple variables. All the analyses were stratified by gender. **Results:** The 4th quartile UA group (male, UA ≥ 6.8 mg/dL; female, UA ≥ 5.4 mg/dL) showed a higher risk of AKI than the 1st quartile group (male, UA<4.4 mg/dL; female, UA<3.5 mg/dL) as following ORs: 3.2 (2.53-3.91) in males (P<0.001); and 2.8 (2.17-3.59) in females (P<0.001). There were more patients who did not recover from AKI in the 4th quartiles than in the 1st quartiles, as following ORs: 1.5 (1.11-1.95) in males (P<0.001); and 2.5 (1.63-3.98) in females (P<0.001). The 4th quartile group had a higher risk of all-cause mortality than the 1st quartile group, as following HRs: 2.0 (1.38-2.86) in males (P<0.001); and 1.3 (1.09-1.51) in females (P=0.003). The in-hospital mortality risk was also higher in the 4th quartile than in the 1st quartile, which was only significant in males: OR, 2.4 (1.56-3.77) (P<0.001). **Conclusions:** Hyperuricemia increases the risks of AKI and all-cause mortality in hospitalized patients.

Figure 2. Nonlinear relationships between UA and the risk of AKI



Male



Female