Abstract Type : Oral
Abstract Submission No. : 1722

Insulin resistance is associated with incident chronic kidney disease in population with normal renal function

Su Hyun Song, Eun Hui Bae, Soo Wan Kim, Seong Kwon Ma, Chang Seong Kim, Hong Sang Choi, Sang Heon Suh, Tae Ryom Oh, Young Jin Goo
Department of Internal Medicine-Nephrology, Chonnam National University Hospital, Korea, Republic of

Objectives: Insulin resistance is prevalent in chronic kidney disease (CKD) and may accelerate its progression. This study aimed to investigate whether insulin resistance was associated with the development of incident CKD in a population with normal renal function.

Methods: A total of 3,331 individuals with normal renal function from a community-based cohort formed the study population. We determined the relationship between insulin resistance indices and incident CKD using Cox proportional hazard model and Kaplan-Meier survival analysis.

Results: During a mean follow-up of 11.03 ± 4.22 years, incident CKD occurred in 414 (12.4%) participants. The high homeostasis model assessment-insulin resistance (HOMA-IR) level group had an increased risk of incident CKD (HR, 1.40; 95% CI, 1.13-1.74; p = 0.002) compared to the normal group after adjusting for confounding factors The risk of incident CKD also increased with lower quantitative insulin sensitivity check index (QUICKI) levels (HR, 0.62; 95% CI, 0.41-0.92; p = 0.018) and higher leptin-adiponectin ratio (LAR) levels (HR, 1.23; 95% CI, 1.06-1.42; p = 0.006).

Conclusions: Higher insulin resistance indices were associated with the incidence of CKD. Our data suggests that increased insulin resistance may be involved in the development of incident CKD in individuals with normal renal function.

Figure 1. Kaplan-Meier free-CKD probability curve with the log-rank test between high HOMA-IR group and incident CKD. High group is associated with poor free-CKD probability compared to normal group.

Figure 1. Kaplan-Meier free-CKD probability curve with the log-rank test between high HOMA-IR group and incident CKD. High group is associated with poor free-CKD probability compared to normal group.

Number at risk					
Normal group	2125	1921	1790	1625	1470	825
High group	779	709	650	578	515	268
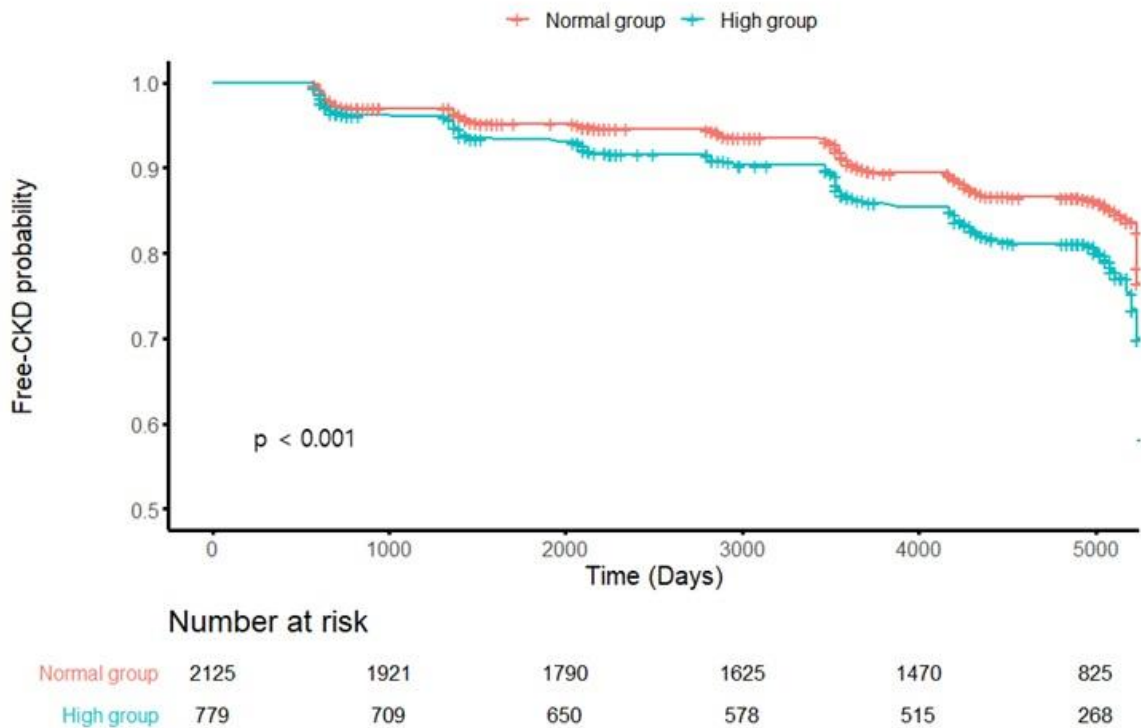
Abbreviations: CKD, chronic kidney disease; HOMA-IR, homeostasis model assessment-insulin resistance.

Table 1. Hazard ratio for incident chronic kidney disease by HOMA-IR, QUICKI, HOMA-AD and LAR with Cox proportion hazard models

Table 1. Hazard ratio for incident chronic kidney disease by HOMA-IR, QUICKI, HOMA-AD and LAR with Cox proportion hazard models

	Unadjusted		Adjusted					
			Model 1		Model 2		Model 3	
	HR (95% CI)	p-value	HR (95% CI)	p-value	HR (95% CI)	p-value	HR (95% CI)	p-value
HOMA-IR	1.22 (1.13-1.33)	<0.001	1.19 (1.12-1.27)	<0.001	1.16 (1.08-1.25)	<0.001	1.13 (1.05-1.22)	0.001
QUICKI*10	0.50 (0.33-0.74)	<0.001	0.46 (0.31-0.67)	<0.001	0.58 (0.39-0.86)	0.006	0.62 (0.41-0.92)	0.018
HOMA-AD	1.05 (1.00-1.11)	0.031	1.06 (1.01-1.11)	0.021	1.03 (0.97-1.08)	0.357	1.03 (0.98-1.08)	0.291
LAR	1.16 (1.04-1.29)	0.007	1.29 (1.14-1.47)	<0.001	1.21 (1.05-1.40)	0.008	1.23 (1.06-1.42)	0.006

Hazard ratios (95% CIs) for incident chronic kidney disease according to HOMA-IR, QUICKI, HOMA-AD, and LAR.
Model 1: adjusted for age and sex.
Model 2: Model 1 + hypertension, body mass index and total cholesterol.
Model 3: Model 2 + alcohol drinking, smoking and eGFR
Abbreviations: HR, hazard ratio; CI, confidence interval; HOMA-IR, homeostasis model assessment-insulin resistance; QUICKI, quantitative insulin sensitivity check index; HOMA-AD, homeostasis model assessment-adiponectin; LAR, leptin-adiponectin ratio.