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ALDEHYDE DEHYDROGENASE 2 POLYMORPHISM, ALCOHOL CONSUMPTION AND THE INCIDENT CHRONIC KIDNEY DISEASE

Hyun Jin Lee, Kootae Park, Haekyung Lee, Hyungnae Kim, Jin Seok Jeon, Hyunjin Noh, Soon Hyo Kwon
Department of Internal Medicine-Nephrology, Soonchunhyang University Seoul Hospital, Korea, Republic of

Objectives : Mitochondrial aldehyde dehydrogenase 2 (ALDH2) is a key enzyme involved in alcohol metabolism. Variants in ALDH2 are associated with increased risks of cardiovascular disease, hypertension, and heart failure with preserved ejection fraction. However, the relationship between ALDH2 variants (GG, GA, and AA) and chronic kidney disease (CKD) remains uncertain. This study aimed to investigate the incidence of CKD according to ALDH2 alleles.
Methods : We analyzed 5,369 individuals without CKD from the Korean Genome and Epidemiology Study (KoGES). This prospective, community-based cohort consists of middle-aged Koreans (40–69 years old), residing in specific regions of South Korea. Participants were followed up every two years through health surveys and standardized protocols. A multivariable Cox proportional hazards regression was performed to assess the independent association of ALDH2 polymorphisms with incident CKD. CKD was defined as an estimated glomerular filtration rate (eGFR) <60 mL/min or proteinuria ≥1+ on two consecutive measurements ≥90 days apart. Covariates included age, sex, diabetes, hypertension, hyperlipidemia, smoking history, alcohol consumption, education, baseline eGFR, hemoglobin, income and physical activity.
Results : Among participants, 2,580 (48.05%) were men, and 3,301 (61.48%) were less frequent drinkers. The minor allele frequency (GA+AA) was 1,551 (28.88%). CKD incidence was 26%. The hazard ratio (HR) for CKD in GA+AA vs. GG was 1.07 (95% CI, 0.95–1.30), showing no significant association. Separate analyses of GG and GA+AA showed no CKD difference across alcohol consumption levels. No significant differences were found after stratification by sex and alcohol intake.
Conclusions : ALDH2 polymorphisms did not influence CKD occurrence, regardless of sex and alcohol intake. Drinking behavior by ALDH2 genotype also had no effect. These findings suggest that ALDH2 variants and alcohol consumption are not major CKD risk factors.

Table1.PNG

Table 1. Cox proportional hazard modeling of Incident CKD

	Model 1				Model 2			
	HR	95% LCL	95% UCL	*p value*	HR	95% LCL	95% UCL	*p value*
ALDH2 genotype, GG/(GA+AA)	1.03	0.92	1.17	0.584	1.07	0.94	1.23	0.295
Alcohol consumption, (Intermediate+High/None+Low)	0.78	0.69	0.89	<0.001	1.05	0.88	1.26	0.558
Age	1.09	1.08	1.10	<0.001	1.08	1.07	1.09	<0.001
Sex(m)	0.78	0.70	0.87	<0.001	0.59	0.46	0.75	<0.001
BMI	1.07	1.05	1.09	<0.001	1.04	1.02	1.06	<0.001
DM, n(%)	2.51	2.11	2.99	<0.001	1.80	1.50	2.16	<0.001
HTN, n(%)	2.50	2.20	2.84	<0.001	1.52	1.32	1.74	<0.001
Hyperlipidemia, n(%)	0.92	0.64	1.32	0.650	0.84	0.58	1.21	0.350
Smoking								
Never, n(%)	ref				ref			
Former, n(%)	0.88	0.74	1.03	0.113	1.08	0.86	1.36	0.484
Current, n (%)	0.82	0.71	0.94	0.005	1.31	1.06	1.62	0.011
Physical activity(MVPA), n(%)	1.15	1.02	1.29	0.023	0.98	0.87	1.11	0.761
HB	1.00	0.96	1.03	0.782	1.02	0.96	1.08	0.557
Income, n(%)								
low	ref				ref			
intermediate	0.61	0.53	0.70	<0.001	1.10	0.95	1.29	0.201
high	0.54	0.46	0.64	<0.001	0.99	0.81	1.20	0.884
EDU, n(%)								
Low	ref				ref			
Middle	0.62	0.54	0.73	<0.001	1.26	1.07	1.49	0.006
High	0.51	0.45	0.58	<0.001	1.23	1.04	1.45	0.017
eGFR	0.96	0.95	0.96	<0.001	0.96	0.96	0.97	<0.001

p<0.05* <0.01 <0.001****

[a]Model 1 : Unadjusted

[b]Model 2 : adjusted for 음주, age, sex, BMI, DM, HTN, Hyperlipidemia, Smoke, MVPA, HB, Income, EDU and eGFR

Table1.PNG

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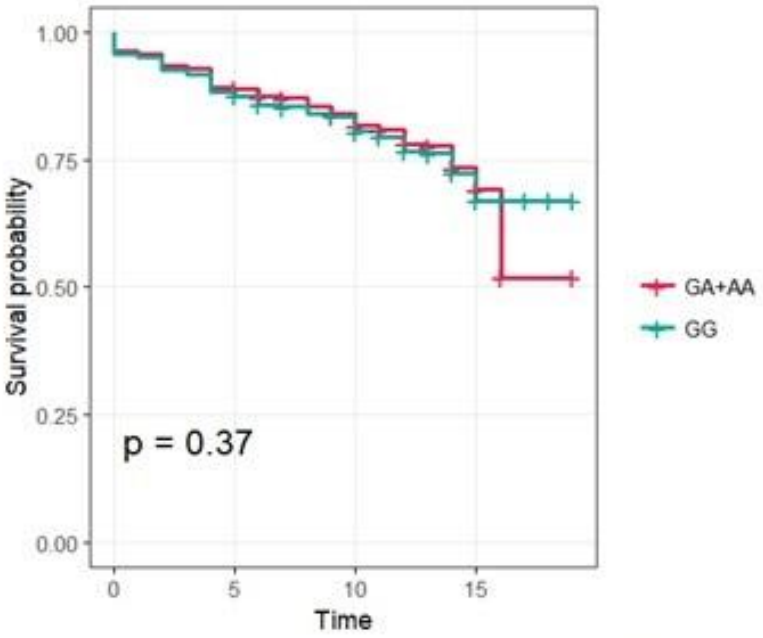

Number at risk

GA+AA	1551	1385	1262	52	0
GG	3818	3368	3130	120	0
	0	5	10	15	20

Time