THE KOREAN SOCIETY OF NEPHROLOGY
APCN & KSN 2024
June 13(Thu) - 16(Sun), 2024 Coex, Seoul, Korea
APSN
Promoting Sustainable Kidney Health: The Asia-Pacific and Beyond

Abstract Submission No.: A-1282

Exploring the Genetic Interrelationships among Major Morbidities: A Comprehensive Study

Yaerim Kim[1], Moobeom Hong[2], Yunmi Ji[2], Boram Weon[3], Ara Ko[4], Seunghyun Han[4], Jung Pyo Lee[3], Sungho Won[5], Jeonghwan Lee[3]
[1]Department of Internal Medicine-Nephrology, Keimyung University Dongsan Medical Center, Korea, Republic of
[2]Department of College of Natural Sciences, Interdisciplinary Program in Bioinformatics, Seoul National University, Korea, Republic of
[3]Department of Internal Medicine-Nephrology, Seoul National University Boramae Medical Center, Korea, Republic of
[4]Department of Internal Medicine-Nephrology, Seoul National University Hospital, Korea, Republic of
[5]Department of Department of Public Health Sciences, Institute of Health & Environment, Seoul National University, Korea, Republic of

Objectives : Major morbidities such as hypertension, diabetes, dyslipidemia, cardiovascular disease (CVD), and chronic kidney disease (CKD) has a significant hazard impact on mortality. Although, these morbidities complicatedly interrelate with each disease, there was a lack of data to reveal the genetic correlation. Herein, we aimed to evaluate the genetic interrelationship of major morbidities.
Methods : Major morbidities consisted with hypertension, type 2 diabetes, dyslipidemia, gout, proteinuria, major CVD, and CKD. We employed Genome-Wide Association Study (GWAS) summary statistics from the Finngen and CKDgen dataset for each disease. Single nucleotide polymorphism (SNP) was selected based on the 0.01 of minor allele frequency. To assess heritability, we conducted Cross-Trait LD score regression using GWAS summary statistics. We utilized the Spearman rank correlation coefficient to analyze the correlation between the two diseases.
Results : In total, 4 million SNPs were included in the analysis for each disease, derived from a sample size of approximately 400,000 individuals. We observed varying heritability across different morbidities, with hypertension exhibiting the highest heritability (0.0938) and proteinuria showing the lowest (0.0043). We found significant genetic correlations between each morbidity. Major CVD showed genetic correlations with most morbidities except CKD. Type 2 diabetes correlated genetically with hypertension, dyslipidemia, and gout. Dyslipidemia was correlated with hypertension and gout, and hypertension was correlated with gout. The strongest correlation was observed between major CVD and dyslipidemia (0.74±0.05), followed by major CVD and hypertension (0.59±0.03).
Conclusions : Although major CVD is a significant indicator representing higher genetic correlation with other morbidities, there was no significant correlation between CVD and CKD. Considering that CKD and CVD are leading causes of mortality, exploring the correlation between them may necessitate an approach beyond genetic factors, considering alternative perspectives.