Role of genetic variants in gene encoding lipocalin-2 in the development of elevated blood pressure

15

BMY Cheung, KL Ong, AWK Tso, SS Cherny, PC Sham, TH Lam, KSL Lam
Department of Medicine, The University of Hong Kong, Hong Kong

Introduction: Lipocalin-2 is recently recognised as a biomarker of obesity and inflammation, which are both risk factors for hypertension. We therefore investigated the association of common single nucleotide polymorphisms (SNPs) in the gene encoding lipocalin-2 (*LCN2*) with elevated blood pressure in Hong Kong Chinese.

Methods: Five tagging SNPs were genotyped in 1936 subjects from the Hong Kong Cardiovascular Risk Factor Prevalence Study-2 (CRISPS-2) with a median follow-up period of 6.4 years. Elevated blood pressure was defined as ≥130/85 mm Hg or taking anti-hypertensive medication.

Results: There were only two haplotypes with frequency of >5%, namely AGATC (45.5%) and GGTCC (41.2%). Haplotype GGTCC was associated with elevated blood pressure at follow-up (OR=1.17 compared to haplotype AGATC, P=0.031 after adjusting for age and sex). Among 1381 subjects without elevated blood pressure at baseline, 321 subjects developed elevated blood pressure at follow-up. Haplotype GGTCC was associated with the development of elevated blood pressure at follow-up (OR=1.30 compared to haplotype AGATC, P=0.011 after adjusting for age, sex, systolic blood pressure, and follow-up duration; OR=1.44, P=0.0015 after further adjusting for other covariates). Among subjects not taking anti-hypertensive medication, carriers of the haplotype GGTCC had higher systolic blood pressure than non-carriers (119.7±16.4 mm Hg vs 117.9±17.3 mm Hg, P=0.043).

Conclusion: Our findings suggest, for the first time, that genetic variants in *LCN2* may affect blood pressure. Further studies on the role of lipocalin-2 in blood pressure regulation are warranted.

Acknowledgement: This study was funded by Hong Kong Research Grant Council grants (HKU7229/01M and HKU7626/07M) and the Sun Chieh Yeh Heart Foundation.

Association of genetic variants in gene encoding lipocalin-2 with plasma alanine aminotransferase and aspartate aminotransferase

16

BMY Cheung, KL Ong, A Xu, TH Lam, KSL Lam
Department of Medicine, The University of Hong Kong, Hong Kong

Introduction: Lipocalin-2 is a biomarker for obesity, inflammation and insulin resistance, which are all risks factors for non-alcoholic fatty liver disease (NAFLD). Subjects with NAFLD have elevated circulating levels of lipocalin-2 and liver enzymes such as alkaline phosphatase (ALP), alanine aminotransferase (ALT), aspartate aminotransferase (AST) and γ-glutamyl transaminase (GGT). We therefore investigated the relationship of genetic variants in the gene encoding lipocalin-2 (*LCN2*) with plasma ALP, ALT, AST and GGT.

Methods: Five tagging single nucleotide polymorphisms (SNPs) were genotyped in 1337 subjects in the Hong Kong Cardiovascular Risk Factor Prevalence Study-2 (CRISPS-2) who had plasma liver enzymes measured.

Results: The minor T allele of the SNP rs10987900 was significantly associated with 9.6% (95% CI, 2.7-16.0%) lower plasma ALT level (P=0.0069) and 6.2% (95% CI, 1.6-10.6%) lower plasma AST (P=0.0092) after adjusting for age and sex. The geometric mean (95% CI) of plasma ALT in subjects with CC, CT and TT genotypes were 21.6 (20.9-22.3), 19.9 (18.4-21.5) and 16.4 (12.2-22.1) U/L respectively and those of plasma AST were 22.9 (22.4-23.4), 21.5 (20.6-22.4) and 20.7 (17.6-24.3) U/L respectively. The association remained significant after excluding regular drinkers (P=0.0092 and 0.0035 for ALT and AST, respectively) and after further adjusting for body mass index, triglycerides, high-density lipoprotein cholesterol, 2-hour glucose level, insulin resistance index, C-reactive protein, fibrinogen, regular drinking and current smoking (P=0.022 and 0.014 respectively).

Conclusion: This study provides further evidence for the role of lipocalin-2 in the development of NAFLD.

Acknowledgement: This study was funded by Hong Kong Research Grant Council grants (HKU7229/01M and HKU7626/07M) and the Sun Chieh Yeh Heart Foundation.