

THE ASSOCIATION OF CRP GENE
POLYMORPHISMS WITH SERUM CRP LEVEL AND
GRIP STRENGTH IN COMMUNITY-DWELLING
ELDERS IN TAIWAN

社區老人 CRP 基因多型性與血清濃度、握力的相關性

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Low grip strength is one of components for frailty, which is characterized by the loss of reserves including energy, physical ability, cognition and health. The purpose of this study evaluated the effect of five single-nucleotide polymorphisms (SNPs) in the C-reactive protein (CRP) gene on serum CRP level and grip strength in elderly Taiwanese. Five SNPs (rs1130864, rs1800947, rs1205, rs2794520, and rs3093059) of the CRP gene were utilized to genotype 472 unrelated elderly subjects (mean age, 73.8 ± 6.1 years). Linkage disequilibrium (LD) was analyzed for these five SNPs. The frequency of each haplotype was estimated using the PLINK. This study is the first study to examine the association of CRP gene polymorphisms with serum CRP level and grip strength in elderly Taiwanese. Grip strength was measured by handgrip dynamometer (TTM-110D, TTM co. Japan) and low grip strength was defined as grip strength in the lowest quintile according to subgroups of gender and body mass index. Our study further demonstrates that the minor alleles of two CRP SNPs (rs2794520 and rs1205) vary across racial populations. In our study, the minor alleles of these two SNPs were C whereas these minor alleles were either T in most ethnic groups. Our study findings indicate that there exist statistically significant associations between the CRP level and three CRP genotypes (rs2794520, rs1205 and

rs3093059). In particular, the SNP rs3093059 CC genotype had simultaneously influenced on increasing levels of CRP and decreasing of grip strength. Genotype and sex interactions were found for SNPs rs2794520 and rs1205 of CRP gene in relation to CRP levels ($p < 0.05$). Additionally, the haplotype (CCCC) was associated with increased levels of CRP ($\exp(\beta) = 1.46$; $p < 0.001$) and decreasing of grip strength ($\beta = -0.87$ kg, $p < 0.05$).

We conclude that polymorphism in the CRP gene affects serum CRP levels and grip strength, rs3093059 CC genotype and the C-C-C-C-C haplotype appear to be susceptibility biomarkers for elders, but further study may be required.