

GRIP STRENGTH AND VITAMIN D RECEPTOR GENE POLYMORPHISMS IN COMMUNITY-DWELLING ELDERLY IN TAIWAN

VDR 基因多型性對老人握力的影響

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Background: Low grip strength is one of frailty markers. Frail elders are considered to be vulnerable to adverse health outcomes, including mortality, institutionalization, falls, and hospitalization. VDR is the gene for the 1,25-dihydroxyvitamin D3 receptor (VDR), a nuclear hormone receptor. In humans, VDR is located on chromosome 12. Two single nucleotide polymorphisms (SNPs) of VDR are considered in this study. The aim of this study was to determine whether single nucleotide polymorphisms (rs2239185 and rs1544410) of VDR are associated with grip strength in Taiwanese elders.

Methods: Two SNPs (rs2239185 and rs1544410) of VDR in a total of 470 unrelated elders (250 males and 220 females) were genotyped. Both of these two SNPs have two alleles, A and G, result in three genotypes, A homozygotes (AA), heterozygotes (AG), and G homozygotes (GG). Linkage disequilibrium (LD) was analyzed for these two SNPs. 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 (83 elders as low grip strength and 387 elders as normal grip strength).

Results: The minor allele frequency for rs2239185 and rs1544410 was 0.3045 and 0.0625, respectively. After adjusting for age, gender, and body mass

index (BMI), our study indicates that SNP rs2239185 G/A genotype was significantly associated with decreased grip strength ($\beta=-1.30$ Kg, $p<0.001$) and SNP rs1544410 A/A genotype was associated with decreased grip strength at borderline significance ($\beta=-6.70$ Kg, $p=0.055$). In addition, the adjusted odds ratios of low grip strength were 2.90 (95% CI: 1.23-6.86) and 1.95 (1.10-3.45) among elders with SNP rs2239185 A/A and G/A genotypes compared with elders with G/G genotype.

Conclusion: We conclude that polymorphism rs2239185 in the VDR gene affects grip strength, indicating rs2239185 appears to be a susceptibility biomarker of grip strength. Future research may be needed to confirm this association.