

**SYSTEMATIC REVIEW AND META-ANALYSIS OF
THE ASSOCIATION BETWEEN VITAMIN D LEVELS AND THE
SINGLE NUCLEOTIDE POLYMORPHISMS, *rs7041*, *rs4588*, AND
rs2282679 OF THE GROUP-SPECIFIC COMPONENT GENE (GC)**



IBRAHIM AFZAL

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IBRAHIM AFZAL 5638094 RAME/M

M.Sc. (MEDICAL EPIDEMIOLOGY)

THESIS ADVISORY COMMITTEE: THUNYARAT ANOTHASINTAWEE M.D.,Ph.D.,
CHUSAK OKASCHAREON M.D.,Ph.D., AMMARIN THAKKINSTIAN Ph.D.

ABSTRACT

Background: Previous literature suggested that certain single nucleotide polymorphisms (SNP) of group-specific component gene (GC) (i.e. *rs7041*, *rs4588*, and *rs2282679*) were associated with serum vitamin D level.

Objectives: To assess effects of GC gene including *rs7041*, *rs4588*, and *rs2282679* on serum vitamin D level.

Methods: Studies were located from Medline via PubMed and Scopus databases from initiation to 17th January 2015. All observational studies, published in English were selected if they studied the effect of interested SNPs on serum vitamin D level. Mean differences (MD) of serum vitamin D level between genotypes of each SNP were estimated using multivariate meta-analysis.

Results: A total of 44 studies met inclusion criteria, 25, 20, and 27 studies had data for *rs4588*, *rs7041*, and *rs2282679*, respectively. For *rs4588*; genotype effect of overall pooled MDs of 25 hydroxy vitamin D (25(OH)D) levels, MD1 (AA versus CC) and MD2 (AC versus CC) for Caucasian adults were, -4.119 (-5.408, -2.831) and -1.871 (95%CI: -2.644, -1.097), and homogenous with the I² of 25% and 0%, respectively. For *rs7041*, pooled MD of 25(OH)D level between genotypes TT versus GG (MD1) and TG versus GG (MD2) were, -2.707 (95%CI: -4.91, -0.504) and -1.407 (95%CI: -2.203, -0.612) in Caucasians, with I² 71.4% and 0%, respectively. For *rs2282679*, pooled MD of 25(OH)D level between genotypes TT versus GG (MD1) and TG versus GG (MD2) for Caucasians were, -3.598 (95%CI: -5.086, -2.111) and -1.841 (95%CI: -2.743, -0.94), with I² of 76% and 80.4%, respectively.

Conclusions: The SNPs *rs4588* and *rs2282679* showed negative association with level of serum 25(OH)D.

KEY WORDS: VITAMIN D/*rs7041*/ *rs4588*/*rs2282679*/GC

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