Polymorphisms in the vascular endothelial growth factor (VEGF) gene associated with asthma

H.Y. Lu\textsuperscript{1}, G.L. Zhao\textsuperscript{2} and M.F. Fu\textsuperscript{3}

\textsuperscript{1}Department of Respiration, Zoucheng People’s Hospital, Zoucheng, Shandong, China
\textsuperscript{2}Department of Internal and Emergency Medicine, Jining No. 1 People’s Hospital, Jining, Shandong, China
\textsuperscript{3}Department of Radiology, Zoucheng People’s Hospital, Zoucheng, Shandong, China

Corresponding author: G.L. Zhao
E-mail: liyan3000@yeah.net

Received October 22, 2015
Accepted December 28, 2015
Published May 6, 2016
DOI http://dx.doi.org/10.4238/gmr.15027880

ABSTRACT. It has been proven that vascular endothelial growth factor (VEGF) is involved in airway restoration and the development of asthma. We sought to examine the relevance of \textit{VEGF} gene polymorphisms to asthma in the Chinese Han population. We extracted the whole genomic DNA from the peripheral blood of 471 participants, including 226 patients with asthma and 245 healthy controls. Seven single nucleotide polymorphisms (SNPs) of the \textit{VEGF} gene were genotyped using the MassARRAY system. The data were then analyzed using HaploView 4.0 and SPSS 20.0 softwares. When comparing the asthma and control groups, significant differences were found in the genotype frequencies of rs3025020 and rs3025039 (\(P = 0.001\) and \(P = 0.011\), respectively). The T alleles in rs3025020 and rs3025039 were significantly more prevalent in the asthma group than in controls (\(P = 0.0003\), \(P = 0.001\), respectively). Furthermore, a strong linkage...
disequilibrium was observed in three blocks (block1-3). In block3, the asthma group had a significantly lower C-C haplotype frequency of haplotype 1 ($P = 0.000015$), a higher T-C haplotype frequency of haplotype 2 ($P = 0.020$), and a significantly higher C-T haplotype frequency of haplotype 3 ($P = 0.001$). The rs3025020 genotype showed no correlation with the clinical phenotype that may cause asthma. The $VEGF$ SNPs rs3025020 and rs3025039 may be associated with the development of asthma, indicating the role of VEGF in asthma.

**Key words:** Asthma; Vascular endothelial growth factor; Single nucleotide polymorphisms