Polymorphisms of the vitamin D receptor gene and the risk of inflammatory bowel disease: a meta-analysis


1Department of Gastroenterology, Ruijin Hospital, Shanghai Jiaotong University School of Medicine, Shanghai, China
2Department of Nuclear Medicine, Ruijin Hospital, Shanghai Jiaotong University School of Medicine, Shanghai, China

*These authors contributed equally to this study.
Corresponding author: J. Zhong
E-mail: Jimmyzj64@medmail.com.cn

Received November 1, 2012
Accepted May 26, 2013
Published April 8, 2014
DOI http://dx.doi.org/10.4238/2014.April.8.2

ABSTRACT. The gene encoding vitamin D receptor (VDR) is recognized as a promising candidate for indicating the development of inflammatory bowel disease (IBD). Four genetic polymorphisms (ApaI, BsmI, FokI, TaqI) in VDR have been widely evaluated to determine their association with IBD, and the results of these evaluations are often inconsistent. Therefore, we conducted a meta-analysis to shed some light on this issue and explored the sources of the heterogeneity between studies. We identified six articles for ApaI (cases/controls: 1902/1468), eight for TaqI (3053/2145), and five each for BsmI (1512/1616) and FokI (2315/1676). Data were analyzed under the random-effects model, and heterogeneity was explored by subgroup analyses. Overall, except for TaqI in allelic comparison [odds ratio (OR) = 0.90, 95% confidence interval (CI): 0.83-0.98], ApaI, BsmI, and FokI polymorphisms showed no significant associations with IBD across different genetic models of inheritance. However, subgroup analyses indicated significance for the association of ApaI with Crohn’s
disease (CD) risk (AA versus aa: OR = 1.40; 95%CI = 1.05-1.88), for BsmI in East Asians (BB plus Bb versus bb: OR = 1.77, 95%CI = 1.14-2.74), for TaqI in Caucasians (TT plus Tt versus tt: OR = 0.79, 95%CI = 0.63-1.00), and with ulcerative colitis (UC) risk (T versus t: OR = 0.89, 95%CI = 0.80-0.99). There was a low probability of publication bias for all studied polymorphisms. Pooling previous individual studies on IBD, our findings demonstrated that the ApaI polymorphism may increase the risk of CD, whereas the TaqI polymorphism may decrease the risk of UC, especially in Caucasians. Moreover, this study leaves open the question of divergent genetic profiles across different ethnic groups.

Key words: Vitamin D receptor; Polymorphism; Association study; Inflammatory bowel diseases; Meta-analysis