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Associations between protocadherin 15 gene variations and susceptibility to noise-induced hearing loss in a Chinese population

Xuhui Zhang[1], **Yi Liu**[2], **Lei Zhang**[1], **Zhang Ping Yang**[1], **Cai Xia Jiang**[1], **Qiang Wang**[1], **Shuai Zhang** and **Yimin Zhu**[2]
[1]Hangzhou Center for Disease Control and Prevention, PR China
[2]Zhejiang University School of Public Health, PR China

The purpose of this study was to examine the associations between genetic variations in the Protocadherin 15 gene (PCDH15) and the genetic susceptibility to noise-induced hearing loss (NIHL) in a Chinese population. A case-control study was conducted with 476 noise-sensitive workers (NSW) and 475 noise-resistant workers (NRW) matched for age, gender, years of noise exposure, and noise intensity exposure. 13 tag single-nucleotide polymorphisms in PCDH15 were genotyped using nanofluidic dynamic arrays on the Fluidigm platform. Multivariate logistic regression was used to analyze the associations between the genetic variations of PCDH15 and NIHL, adjusted by age, smoking/drinking status, and cumulative noise exposure. The results indicated that rs1104085 and haplotypes constructed using rs4540756 (A/T), rs10825122 (T/A), and rs12258253 (T/C) were associated with NIHL risk. The subjects carrying variant alleles (CT or CC) of rs11004085 had a decreased risk for NIHL (adjusted odds ratio=0.587, 95% confidence interval 0.409 to 0.842) compared with subjects who had the wild-type (TT) homozygotes. The interactions of rs1100085, rs10825122, rs1930146, rs2384437, rs4540756, and rs2384375 with noise exposure modified the risk for NIHL. Genetic variations of PCDH15 are associated with genetic susceptibility to NIHL and modified NIHL risk. Gene and noise exposure interactions play an important role in NIHL incidence in the Chinese population studied.

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Biography

Xuhui Zhang has completed her Master degree of Epidemiology & Biostatistics from Zhejiang University School of Public Health. She services at Hangzhou Center for Disease Control and Prevention, China

zhuym@zju.edu.cn