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HuGE systematic review and meta-analysis demonstrate association of CASP-3 and CASP-7 genetic polymorphisms with cancer risk

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ABSTRACT. Genetic variations in the caspase genes CASP-3 and CASP-7 are known to be involved in apoptosis, cytokine maturation, cell growth and differentiation. Polymorphisms of CASP-3 and CASP-7 genes have been increasingly recognized as important regulators in the development of cancer. However, whether there is a specific association is still controversial. Therefore, we made a Human Genome Epidemiology review and meta-analysis to explore the association between polymorphisms of CASP-3 and CASP-7 genes and cancer risk. Based on the inclusion criteria, we examined 9 case-control studies, with a total of 3142 cancer cases and 3670 healthy controls. Meta-analysis results showed that the homozygote (CC) of rs2705897 in the CASP-3 gene is positively associated with cancer susceptibility [odds ratio (OR) = 4.36, 95% confidence interval (CI) = 1.26-15.11, P = 0.02], while the C allele and C carrier (TC+CC) of rs1049216 are negatively associated with cancer risk (OR = 0.81, 95%CI = 0.69-0.95, P = 0.01; OR = 0.78,

95%CI = 0.63-0.97, P = 0.02, respectively). The G allele and G carrier of rs4647603 (A/G) in CASP-3 had positive associations with cancer susceptibility (OR = 1.69, 95%CI = 1.37-2.09, P < 0.001; OR = 1.93, 95%CI = 1.26-2.93, P = 0.002, respectively). The T allele of rs12415607, the G allele and homozygote (GG) of rs2227310, and homozygote (CC) of rs3124740 also had positive associations with cancer risk (OR = 1.18, 95%CI = 1.02-1.37, P = 0.03; OR = 1.17, 95%CI = 1.01-1.34, P = 0.03; OR = 1.34, 95%CI = 1.04-1.74, P = 0.03; OR = 1.30, 95%CI = 1.04-1.63, P = 0.02, respectively). In addition, homozygote (AA) of rs11196418 showed a significant negative association with cancer risk (OR = 0.36, 95%CI = 0.14-0.93, P = 0.03). These meta-analysis results demonstrated that CASP-3 and CASP-7 genetic polymorphisms are involved in the pathogenesis of cancer.

Key words: Caspase 3; Genetic polymorphism; Susceptibility; Cancer; Meta-analysis