Investigation of the effects of single-nucleotide polymorphisms in DNA repair genes on the risk of glioma

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ABSTRACT. Several single-nucleotide polymorphisms (SNPs) in DNA repair gene have been shown to affect DNA repair and to modify susceptibility to cancer. In this study, to investigate the role of these SNPs in glioma, we examined the potential association of 14 SNPs in DNA repair genes with the glioma risk in a Chinese population. We included 326 glioma cases and 376 cancer-free controls. Genotyping of the 14 SNPs was performed on 384-well plates on the Sequenom MassARRAY platform. Of the 14 SNPs, rs1799782 and rs1799793 did not display the Hardy-Weinberg equilibrium in the control group. Moreover, the genotype distribution differed significantly between the two groups for the SNPs rs25487, rs3218536, and rs1799793. The rs25487 G/G genotype strongly and significantly increased the risk of glioma when compared with the rs25487 A/A genotype, indicated by an odds ratio (OR) = 2.23 [95% confidence interval (95%CI) = 1.36-3.87]. The rs25489 A/G genotype was also significantly associated with increased risk of glioma when compared with the A/A genotype (OR = 1.52; 95%CI = 1.03-2.35). In addition, rs1799782 increased the risk of glioma (OR = 1.89; 95%CI = 1.27-3.04), and a similar association was
found for rs1800067 (OR = 1.89; 95%CI = 1.21-3.07). In conclusion, the results of our study suggest that the rs25487, rs25489, rs1799793, and rs13181 SNPs are associated with an increased risk of glioma. These findings may be useful for identifying the genetic factors involved in the development of glioma to help devise more efficient strategies to prevent this disease.

**Key words:** DNA repair gene; Single-nucleotide polymorphisms; Glioma