Relationship between genetic polymorphisms of DNA ligase 1 and non-small cell lung cancer susceptibility and radiosensitivity

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ABSTRACT. The aim of this study was to examine the relationship between genetic polymorphisms in DNA ligase 1 (LIG1) and non-small cell lung cancer (NSCLC) susceptibility and radiosensitivity in a Chinese population. This was a case-control study that included 352 NSCLC patients and 448 healthy controls. Polymerase chain reaction-restriction fragment length polymorphism analysis was conducted to detect HaeIII polymorphisms in exon 6 of the LIG1 gene in this population. This information was used to observe the effects of radiation in patients with different genotypes in order to determine the genotypes associated with radiosensitivity. The CC genotype and C allele frequency were significantly higher in the NSCLC group than in the control group (P = 0.012 and P = 0.023, respectively). The relative risk of experienc-
ing NSCLC was 2.55 [95% confidence interval (CI), 1.12-3.98] for CC homozygous patients and 0.87 (95%CI, 0.46-1.88) for AA homozygous patients. Analysis of LIG1 genetic polymorphisms and radiosensitivity of NSCLC patients showed that AA homozygous patients were significantly more radiosensitive than the control group (AA vs AC, P = 0.014; AA vs CC, P < 0.001; AC vs CC, P = 0.023). Therefore, the LIG1 CC genotype was associated with susceptibility to NSCLC, and the AA genotype demonstrated increased radiosensitivity compared to the AC and CC genotypes.

**Key words:** Gene; Genetics; Non-small cell lung cancer; Radiation effects; Radiation tolerance