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The Relationship Between XRCC1 and XRCC6 Genes Polymorphisms and Renal Cell Carcinoma

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Dear Editor,

Polymorphisms of genes can cause a decrease in DNA repair capacity and disease susceptibility, as well (1, 2). The XRCC genes play a momentous role in comprehension processes of DNA repair in mammals, especially in double-strand break (DSB) repair (3). Therefore, normal activity of XRCC genes is a major factor for cancer prevention. On the other hand, approximately, 84400 new patients of renal cell carcinoma (RCC) are recognized by the Union of Europe. In addition, 34700 kidney cancer-related deaths happened in 2012 (4). The present study aimed to review the correlation between some XRCC1 and XRCC6 genes polymorphism and RCC. In a case control study assessing the relationship between XRCC6 C-1310G (rs2267437) polymorphism and RCC susceptibility, the results indicated that the polymorphism of XRCC6 C-1310G is involved in the etiology of RCC and it can be as a marker in the susceptibility to RCC (5). Furthermore, in a hospital-based case–control study, the association between XRCC6 T-991C (rs5751129) polymorphisms and RCC risk in a Taiwanese population was evaluated. Results of this investigation showed that the XRCC6 T-991C polymorphism is associated with RCC. This polymorphism can lead to the different mRNA expression levels, which can affect expression of the XRCC6 protein and capacity of DSB repair (6). Moreover, Wang et al. in their paper stated that the XRCC6 A-31G polymorphism (rs132770) is associated with the RCC risk and they also suggested that the XRCC6 A-31G polymorphism is an important subject in the RCC etiology (7). On the other hand, regarding the correlation between XRCC1 gene polymorphism and RCC, Hirata et al. (8) declared that XRCC1 399Gln polymorphism can be a risk factor for RCC and their results suggested that the XRCC1 399Gln allele may be linked to RCC susceptibility. In another study, Akhmadishina et al. (9) detected an association between allele A of the c.839G > A locus of the XRCC1 gene and the RCC occurrence and also they declared that polymorphism of c.839G > A in the XRCC1 gene can be contributed in RCC progress at the advanced and early stages of this disease. According to the results, we can understand that polymorphisms of XRCC1 and XRCC6 may greatly be associated with RCC, so that, XRCC6 may be a marker in genetic susceptibility to RCC and a significant subject in its etiology. In addition, XRCC1 can be linked to RCC progress at the advanced and early stages of it or susceptibility to RCC. Finally, it is advised to conduct more studies in order to obtain the comprehensive results regarding RCC and the genes.

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