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Polymorphisms in DNA repair genes and breast cancer risk in Russian population: a case-control study

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Abstract

© 2014, Springer-Verlag Italia. Genetic variation in DNA repair genes can alter an individual's capacity to repair damaged DNA and influence the risk of cancer. We tested seven polymorphisms in DNA repair genes XRCC1, ERCC2, XRCC3, XRCC2, EXO1 and TP53 for a possible association with breast cancer risk in a sample of 672 case and 672 control Russian women. An association was observed for allele A of the polymorphism XRCC1 (R399Q) rs25487 (co-dominant model AA vs. GG: OR 1.76, P = 0.003; additive model OR 1.28, P = 0.005; dominant model: OR 1.29, P = 0.03; recessive model OR 1.63, P = 0.008). Allele T of the polymorphism ERCC2 (D312N) rs1799793 was also associated with breast cancer risk (co-dominant model TT vs. CC: OR 1.43, P = 0.04; additive model OR 1.21, P = 0.02; dominant model: OR 1.30, P = 0.02), but the association became insignificant after applying Bonferroni correction. No association with breast cancer was found for the remaining SNPs. In summary, our study provides evidence that polymorphisms in DNA repair genes may play a role in susceptibility to breast cancer in the population of ethnical Russians.

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Keywords

Breast cancer, DNA repair, Russian population, SNP