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Association between female cancers and aberrations in genes encoding 12- and 15 lipoxygenases

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Both, 12- and 15-lipoxygenases play a key role in inflammatory pathways and generation of reactive oxygen species (ROS), and are linked with cancer. However, investigations on the association between the polymorphic variants of the lipoxygenases and cancers are limited and hence their association with cancer risk remains to be understood. Earlier, we reported increased risk of breast cancer with a functional polymorphism of 12-lipoxygenase. In the present case-control study, we have explored the risk association between the polymorphic gene variants of 12- and 15-lipoxygenases and female cancers. Genes encoding 12- and 15-lipoxygenases are located on chromosome 17 at loci, p13.1 and p13.2, respectively. The sequence similarity between these two genes is reported to be 86%. The SNP examined for 12-lipoxygenase is located in exon 6 (mRNA, A835G; Glu261Arg; rs1126667). This non-synonymous SNP which substitutes glutamine with arginine impairs the enzyme activity. For 15-lipoxygenase a promoter region SNP (C>T; -292C/T; rs11568070) which is known to up regulate the gene expression was examined. The C to T substitution of the polymorphism creates a novel transcription factor binding site for SPI1. A two-fold increased expression of 15-lipoxygenase was reported with the promoter variant containing 'T' allele. The patients studied were affected with either of the cancers of breast, ovaries, endometriumor cervix. The examinations revealed varied association between the cancers and the polymorphisms.

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