Ovarian cancer risk related to inherited inflammation genes

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In a study conducted by researchers at Moffitt Cancer Center and colleagues from 11 other institutions in the Unites States and the United Kingdom, genes that are known to be involved in inflammation were found to be related to risk of ovarian cancer.

Their study appeared in a recent issue of Cancer Research, published by the American Association for Cancer Research.

Chronic inflammation is known to influence risk of several cancers, including ovarian cancer. The researchers identified 27 genes that are involved in inflammation and sought to determine whether inter-individual differences in these genes were related to risk of ovarian cancer. To do that they determined the frequency of 162 single-nucleotide polymorphisms (SNPs, pronounced "snips") in DNA extracted from a blood sample provided by approximately 900 women with ovarian cancer (cases) and 1000 cancer-free women (controls). Whenever a SNP is observed it means that there are two forms (alleles) of the gene and the least common one is termed the "minor allele." The frequency of 21 of the 162 SNPs differed between the cases and controls and was subsequently examined in a larger study that included 3,100 cases and 2,100 controls from five independent studies.

"When we examined the relationship between SNPs in inflammation-related genes and the risk of ovarian cancer, we found variants in five of the 27 genes were related to risk. What was interesting to us was that women who carried the minor alleles had lower ovarian cancer risk.

Each SNP appeared to lower risk by about 10 percent," explained study co-author Thomas A. Sellers, Ph.D., M.P.H., Moffitt executive vice president and director of the Moffitt Research Institute.

One of the genes encodes Interleuken 1 alpha (IL1A), a cytokine, or a small signaling protein molecule that is involved in numerous immune and inflammatory responses, said the authors. IL1A has been associated with many inflammatory response conditions and diseases. In this study, the researchers found that IL1A, and another gene, AloX5, "appear to harbor common inherited variants associated with modest differences in the risk of ovarian cancer."

"The importance of inflammation pathways in the development of many cancers prompted us to examine this association between SNPS in inflammation-related genes and risk for ovarian cancer," explained Sellers. "If these results can be confirmed, it might provide insights into how risk may be reduced, through strategies to lower chronic inflammation."

The authors noted that in 2011 there were an estimated 225,500 new cases of ovarian cancer worldwide. Although some women are at greatly elevated risks of ovarian cancer due to inherited mutations in the BRCA1 and BRCA2 genes, these are rare in the population and account for perhaps 10 percent of cases. However, a substantial portion of genetic influence on ovarian cancer risk has been "unexplained" and some of that may be due to common genetic variants. Sellers points out that "the Il1A variant that was most strongly protective is carried by 30 percent of women in the study, so the impact at the population level is not trivial."

Provided by H. Lee Moffitt Cancer Center & Research Institute