Genes involved in vitamin D generation and destruction may influence colorectal cancer risk in African-Americans

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African-Americans are more likely than non-Hispanic whites to have and die from colorectal cancer. Changes in the DNA sequence of genes that affect how the body makes and destroys vitamin D modify the risk for colorectal cancer in African-Americans, according to data presented at the Fifth AACR Conference on The Science of Cancer Health Disparities, held here Oct. 27-30, 2012.

"Vitamin D deficiency is associated with a higher risk for colorectal cancer," said Fabio Pibiri, Ph.D., a postdoctoral associate at the University of Illinois at Chicago. "Because increased skin pigment lowers the amount of ultraviolet light that can be used to make vitamin D in the skin, more African-Americans than whites are vitamin D-deficient, putting them at higher risk for colorectal cancer. Our research showed that genetic differences may play an important role as well."

Pibiri and colleagues evaluated 39 single nucleotide polymorphisms (SNPs), DNA sequence variations, in vitamin D-related genes in 1,799 African-Americans—961 patients with colorectal cancer and 838 controls—who participated in the North Carolina Colorectal Cancer Study and the Chicago Colorectal Cancer Consortium.

They found several SNPs in genes involved in the generation and destruction of vitamin D that were associated with colorectal cancer.

One variation in the gene that tells a cell to make the protein that destroys vitamin D was linked to protection from developing colorectal cancer on the left side of the body. According to Pibiri, this variation is specific to African-Americans and the finding may explain why African-Americans have a lower proportion of left-sided colorectal cancer compared with right-sided colorectal cancer.

"It seems likely that these differences in the DNA sequence alter the function of the vitamin D-related genes," said Pibiri. "For example, we hypothesize that the genetic variation linked to protection decreases levels of the vitamin D-destroying protein. Now all we need to do is show that."

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