Head & Neck Cancer: Methylation May Link Diet & Outcomes

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CHICAGO—In the case of head and neck squamous cell carcinoma patients, doctoral students at the University of Michigan are hypothesizing that epigenetic changes in methylation might mediate the relationship between diet and longevity.

In a poster study reported here at the AACR Annual Meeting (Abstract 2642), the authors say these preliminary results suggest that dietary intake may influence the tumor DNA methylation profile in that cancer and that intake of specific micronutrients may enhance tumor suppression and possibly contribute to survival.

First author Anna E. Arthur, a third-year PhD student in the Department of Environmental Health Sciences at the University of Michigan, said the researchers specifically looked at micronutrients involved in the one-carbon metabolism pathways, necessary for donating methyl groups and for DNA methylation.

“We wanted to see if methylation of tumor-suppressor genes was associated with dietary intake of micronutrients, either involved in 1-carbon metabolism or in some sort of antioxidant effect,” she said.

Dietary data were measured by a food frequency questionnaire, said second author Justin A. Colacino, also a third-year PhD student in Environmental Health Sciences at the University of Michigan School of Public Health.

Senior author was Laura S. Rozek, PhD, Assistant Professor of Environmental Health Sciences.

Study data were from 49 patients identified through the University of Michigan Head and Neck Specialized Program of Research Excellence, an NCI-funded program project.

“We found that the individuals in the highest quartile of intake of folate, vitamin B-12, vitamin A, and cruciferous vegetables had significantly lower methylation of tumor suppressor genes,” Colacino said.

In a prior study, Arthur found that higher adherence to a whole-foods dietary pattern—characterized by high intakes of fruits, vegetables, fish, chicken, and whole grains—was associated with better survival and lower cancer recurrence rates, versus a Western dietary pattern high in fat, processed meats, and refined grains.

The authors concluded that although further studies will be needed to explore the effect of diet on head and neck cancer prevention and treatment, dietary intake may influence tumor DNA
methylation in these cancers, and intake of these specific micronutrients may enhance tumor suppression—which could potentially be contributing to extended survival.

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