Study suggests link between obesity and kidney cancer

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This is an image of a weight scale. Credit: CDC/Debora Cartagena

Receptors for leptin, a protein hormone, may be associated with tumor recurrence in patients with renal cell carcinoma (RCC), providing further understanding about molecular links between obesity and RCC tumor formation and prognosis, according to a study at The University of Texas MD Anderson Cancer Center.

The findings are being presented April 18 at the annual meeting of the American Association of Cancer Research (AACR) in New Orleans.

The leptin receptors, called LEPR, were found to be hypermethylated in tumors in a study involving 240 newly diagnosed and previously untreated Caucasian RCC patients. Methylation is a mechanism by which cells control gene expression and both hypomethylation and hypermethylation are known to play roles in silencing of tumor suppressor genes or over-expression of oncogenes in cancer cells. LEPR was one of 20 obesity-related genes that the research team examined.

"Obesity is an established risk factor for RCC with more than 40 percent of these cases attributed to excessive body weight," said Xifeng Wu, M.D., Ph.D., professor of Epidemiology and principal investigator for the study. "Growing evidence suggests that obesity also may be associated with the prognosis of RCC. The molecular mechanism LEPR and two other genes, NPY and LEP, are involved in RCC tumorigenesis. LEPR methylation in tumors is associated with recurrence in RCC patients and thus, LEPR may provide a functional link between obesity and RCC."

The study evaluated the association between methylation of 20 obesity-related genes and RCC. For the discovery portion of the study, 63 tissue pairs of RCC tumors and normal adjacent tissues from the surrounding kidney were used. An additional 177 pairs were included for the validation component of the study.

The patients were mostly males with an average age of 59 years who had never smoked. Most of the patients had clear cell RCC and were at the earliest stage of disease.

"Patients were classified into high- and low-LEPR methylation groups," said Julia Mendoza-Perez, Ph.D., a visiting scientist of Epidemiology at

MD Anderson who presented the findings at AACR. "We found that high LEPR methylation was associated with a significantly higher risk of tumor recurrence."

The results were adjusted by age, gender, pathologic stage of disease, grade, smoking status, body mass index, hypertension and histology.

"In addition, high LEPR methylation in tumors was associated with more advanced tumor features, such as high pathologic stage, high grade, and clear cell RCC histology," said Wu.

The researchers add that future studies are needed to further understand the biology underlying the ties between LEPR methylation and RCC recurrence.

Provided by University of Texas M. D. Anderson Cancer Center