Stress and depression are associated with shorter survival in head and neck cancer patients

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Studies have shown that stress can affect the immune system and weaken the body's defense against infection and disease. In cancer patients this stress can also affect a tumor's ability to grow and spread. However, the biological mechanisms that underlie such associations are not well understood. Now, researchers at Fox Chase Cancer Center find that poor psychosocial functioning is associated with greater vascular endothelial growth factor (VEGF) expression—a signaling protein that not only stimulates tumor growth, but is also associated with shorter disease-free survival in head and neck cancer patients.

"There is research showing that high VEGF expression in other cancers, such as ovarian, is associated with psychosocial factors," says Carolyn Fang, Ph.D., Co-Leader of the Cancer Prevention and Control Program at Fox Chase, who will be presenting the study at the 32nd Annual Meeting & Scientific Sessions of the Society of Behavioral Medicine on Thursday, April 28th. "This information coupled with what we already know about VEGF promoting tumor aggressiveness and poorer prognosis in head and neck cancer patients, certainly gave us a reason to look at this biomarker."

VEGF not only plays a pivotal role in angiogenesis, but it is also regulated by stress hormones and key cytokines—a category of signaling molecules used extensively in intercellular communication.

In the current study, Fang and colleagues looked at 37 newly diagnosed, pre-surgical head and neck cancer patients, to see if psychosocial functioning, such as perceived stress and depressive factors, was associated with VEGF, a biological pathway relating to patient outcomes. The patients were predominantly male (70.3%), and approximately 57-years-old, with primary tumor sites of the oral cavity (65.9%), larynx (19.9%), and oropharynx (13.5%). Over 40% of them were classified as having early-stage disease.

Each patient was given a psychosocial questionnaire to complete prior to treatment, which required them to answer questions about social support, depression, and perceived stress. In addition, VEGF expression in tumor tissue obtained during surgery was evaluated using immunohistochemistry—a process that helps detect the presence of specific proteins in cells or tissues.

"Our analysis indicated that higher levels of perceived stress and depressive symptoms were associated with greater VEGF expression in the tumor tissue of these patients" says Fang. Greater VEGF expression was, in turn, associated with shorter disease-free survival among patients.

The associations between psychosocial functioning and VEGF were strong among early-stage patients, but were less apparent among late-stage patients.

"It's possible that in early stage disease, psychosocial stress makes patients more susceptible to cancer-related death, while in patients with advanced disease, other factors become more important in determining outcome," says Miriam N. Lango, M.D., Medical Director of Speech Pathology Service and Attending Surgeon in Head and Neck Oncology at Fox Chase. "In patients with advanced cancers, psychosocial interventions may have less of an impact since these cancers are

inherently more aggressive."

In the near-term, Fang and her colleagues hope to expand the study to look at a larger sample of patients and to incorporate other signaling pathways that are relevant to cancer, like EGFR, which researchers involved in Fox Chase's Keystone Program in Head and Neck Cancer are already exploring.

"The next step is to conduct a longitudinal study that would allow us to examine patient psychosocial functioning in conjunction with biomarkers of disease aggressiveness and survival from pre-treatment through post-treatment and beyond, which would give us a more complete picture of how these factors may contribute to patient outcomes," Carolyn adds.

Provided by Fox Chase Cancer Center

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