MedicalXpress

Blood vessels might predict prostate cancer behavior

November 3 2009

A diagnosis of prostate cancer raises the question for patients and their physicians as to how the tumor will behave. Will it grow quickly and aggressively and require continuous treatment, or slowly, allowing therapy and its risks to be safely delayed?

The answer may lie in the size and shape of the blood vessels that are visible within the cancer, according to research led by investigators at The Ohio State University Comprehensive Cancer Center-Arthur G. James Cancer Hospital and Richard J. Solove Research Institute in collaboration with the Harvard School of Public Health.

The study of 572 men with localized prostate cancer indicates that aggressive or lethal prostate cancers tend to have blood vessels that are small, irregular and primitive in cross-section, while slow-growing or indolent tumors have blood vessels that look more normal.

The findings were published Oct. 26 in the *Journal of Clinical Oncology*.

"It's as if aggressive prostate cancers are growing faster and their blood vessels never fully mature," says study leader Dr. Steven Clinton, professor of medicine and a medical oncologist and prostate cancer specialist at Ohio State's Comprehensive Cancer Center-James Cancer Hospital and Solove Research Institute.

"Prostate cancer is very heterogeneous, and we need better tools to predict whether a patient has a prostate cancer that is aggressive, fairly

average or indolent in its behavior so that we can better define a course of treatment - surgery, chemotherapy, radiotherapy, hormonal therapy, or potentially new drugs that target blood vessels - that is specific for each person's type of cancer," Clinton says.

"Similarly, if we can better determine at the time of biopsy or prostatectomy who is going to relapse, we can start treatment earlier, when the chance for a cure may be better."

Prostate cancer is the most common cancer in men and the second leading cause of cancer death in American men.

This study analyzed tumor samples and clinical outcome data from men participating in the Health Professionals Follow-Up Study, which involves 51,529 male North American dentists, optometrists, podiatrists, pharmacists and veterinarians.

After an average follow-up of 10 years, 44 of the 572 men had developed metastatic cancer or died of their cancer.

Men whose tumors had smaller vessel diameters were six times more likely to have aggressive tumors and die of their disease, and those with the most irregularly shaped vessels were 17 times more likely to develop lethal prostate cancer.

The findings were independent of Gleason score, a widely used predictor of prognosis based on a prostate tumor's microscopic appearance, and of prostate specific antigen (PSA) level, a blood test used to identify the presence of prostate cancer.

These findings currently apply to men with local disease, whose PSA is only modestly elevated, and who are younger and more likely to choose surgery.

"If our findings are validated by larger studies, particularly in biopsy specimens, the measurement of tumor blood vessel architecture might help determine the choice of therapy, with the goal of improving long-term survival."

Source: Ohio State University Medical Center