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New research may point to better predictor of prostate cancer survival

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New research by USC Norris Comprehensive Cancer Center scientists demonstrates that measuring circulating tumor cells (CTCs) – the cells that spread cancer through the body – may be a better predictor of patient survival than the prostate specific antigen (PSA).

The research was published March 10, 2014 in the *Journal of Clinical Oncology* by a team led by Amir Goldkorn, M.D., assistant professor of medicine at USC Norris, part of Keck Medicine of USC. Goldkorn's team discovered that elevated CTC counts after chemotherapy indicated as much as a five-fold higher risk of death, and for patients whose CTCs dropped by 50 percent or more, the risk of death was cut in half. The study demonstrates CTCs are an important biomarker for cancer research and treatment.

"The significance of these findings is that looking at CTCs before and three weeks after the first cycle of chemotherapy is an early indicator of whether these men would do well with treatment and how long they may live," Goldkorn said. "This could help guide clinicians' treatment decisions and save patients from toxic treatment that won't help them."

According to the American Cancer Society, prostate cancer is the second most common cancer in American men. The society estimates that for 2014, about 233,000 new cases of prostate cancer will be diagnosed and about 29,480 men will die of prostate cancer.

Using blood samples from prostate cancer patients enrolled in phase 3

clinical trial, Goldkorn's team studied baseline counts of CTCs in blood samples before chemotherapy in 263 men. They then measured CTCs three weeks after chemotherapy and determined "hazard ratios" – the likelihood of a patient surviving after chemotherapy.

CTCs are a growing area of interest to many cancer researchers because these cancer cells are shed from tumors into the blood, spreading the cancer throughout the body. The theory behind Goldkorn's research was that isolating and analyzing CTCs could provide a powerful tool giving a snapshot of a patient's cancer at a certain place and time with no need for invasive biopsies.

CTCs are rare – 100 in a typical blood sample, compared to billions of red blood cells and millions of white blood cells. To streamline the isolation process, Goldkorn established a CTC core lab at USC Norris and worked with Yu-Chong Tai of CalTech to create microfilter technology to enrich CTCs in blood samples.

The research sprang from a 2008 phase 3 clinical trial conducted as part of the SouthWest Oncology Group (SWOG), of which USC Norris is a member. Although the drug tested in the trial did not show a positive outcome, the method used – drawing blood before and after treatment starts and counting CTCs – indicated that the number of CTCs could act as a biomarker to determine a patient's clinical course and help select the most appropriate therapy, Goldkorn said.

Goldkorn's team plans to follow up this study with more research analyzing whether choosing therapy based on changes in CTC counts can improve disease outcomes. At the same time, the researchers are molecularly analyzing CTCs to discover what genes they express and what mutations they possess to inform clinicians' courses of treatment.

More information: "Circulating Tumor Cell Counts Are Prognostic of

Overall Survival in SWOG S0421: A Phase III Trial of Docetaxel With or Without Atrasentan for Metastatic Castration-Resistant Prostate Cancer," jco.ascopubs.org/search?fullte … rch-type=QuickSearch