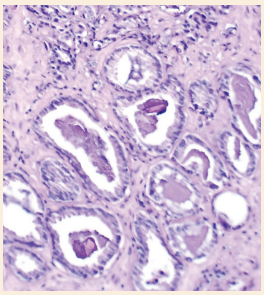
■ Online Exclusive CNE Article

Using Circulating Tumor Cells as a Prognostic Indicator in Metastatic Castration-Resistant Prostate Cancer

Anthony Delacruz, BSN, MSN, RN, ANP, OCN®



Courtesy Otis Brawley

A more reliable tumor marker is needed as a prognostic indicator in metastatic castration-resistant prostate cancer. Circulating tumor cells (CTCs) are cells that have broken away from a tumor and flow in the bloodstream. Evidence has indicated that the presence of CTCs in the peripheral blood of men with solid malignancies correlates with clinical outcomes. When the CTC number is reduced to fewer than five cells per 7.5 ml of blood, survival outcomes often improve. The relationship between the number of CTCs and prognosis has the potential to influence treatment decisions. Therefore, oncology nurses and practitioners must evaluate the scientific evidence, understand the clinical implications, and realize the impact CTC counts may have on practice to effectively communicate the CTC results to a patient. In addition, oncology nurses and practitioners must know that although favorable changes in CTC count are associated with a better prognosis, that alone cannot be used to guide treatment decisions for an individual.

Anthony Delacruz, BSN, MSN, RN, ANP, OCN®, is an adult nurse practitioner in the survivorship department at Memorial Sloan-Kettering Cancer Center in New York, NY. The author takes full responsibility for the content of the article. The author did not receive honoraria for this work. The content of this article has been reviewed by independent peer reviewers to ensure that it is balanced, objective, and free from commercial bias. No financial relationships relevant to the content of this article have been disclosed by the author, planners, independent peer reviewers, or editorial staff. Delacruz can be reached at delacrua@mskcc.org, with copy to editor at CJONEditor@ons.org. (First submission May 2011. Revision submitted July 8, 2011. Accepted for publication July 12, 2011.)

Digital Object Identifier: 10.1188/12.CJON.E44-E47

Prostate cancer is the second most common cancer among men in the United States. The American Cancer Society (2012) estimated that about 241,740 new cases of prostate cancer will be diagnosed in the United States in 2012 and 28,170 men will die of prostate cancer. As new treatment options become available for prostate cancer, men will survive for longer periods of time.

One of the most difficult issues clinicians face in caring for men with metastatic castration-resistant prostate cancer (mCRPC) is assessing the potential benefits of different forms of therapy and overall prognosis. Although guidelines have been established for interpreting prostate-specific antigen (PSA) levels as an indicator for treatment response, serum PSA levels are not consistently a predictor of response duration or survival (Herr, Shipley, & Bajorin, 2009). Even with an effective therapy, serum PSA levels may continue to rise for a period of time before declining, a tumor may continue to increase in size before it regresses, and symptoms may worsen before they improve (Scher et al., 2008). Limitations to PSA testing have long been observed, including the low specificity of the assay and the variability over time. A more reliable tumor marker and indicator to assess clinical outcomes in patients with advanced prostate cancer is needed. Measuring circulating tumor cells (CTCs) may fill that need by associating the outcomes with tumor biology and by serving as a prognostic indicator for survival in mCRPC (Danila et al., 2007).

CTCs are tumor cells that have broken away from either a primary or metastatic tumor and are circulating in the bloodstream. Once in the bloodstream, CTCs have the potential to seed into organs, bone, or the lymphatic system and create additional metastases. Bertazza, Mocellin, and Nitti (2008) reviewed reported data and discussed the prognostic value of CTC as a unique tool for better stratification of patients' risk in a variety of solid tumors, including prostate cancer.

The CellSearch Circulating Tumor Cell system is intended for the immunomagnetic selection, identification, and enumeration of CTCs of epithelial origin in whole blood. In February 2008, the U.S. Food and Drug Administration cleared this new technology as an aid for monitoring men with metastatic prostate cancer. The CellSearch system is the first diagnostic test that allows cells to be isolated from body fluids based on the epithelial cell adhesion molecule through immunomagnetic capture to