

# Clinical Predictors of Fatigue in Men With Non-Metastatic Prostate Cancer Receiving External Beam Radiation Therapy

Li Rebekah Feng, PhD, Mei-kuang Chen, PhD, Nada Lukkahatai, PhD, RN, Chao-Pin Hsiao, PhD, RN, Aradhana Kaushal, MD, Lee Sechrest, PhD, and Leorey N. Saligan, PhD, RN, CRNP, FAAN



© Mark Kostich/Stock/Thinkstock

**Background:** Fatigue is one of the most distressing symptoms experienced by people with cancer receiving radiation therapy.

**Objectives:** The goal of this study is to evaluate clinical predictors of worsening fatigue during external beam radiation therapy (EBRT) in men with non-metastatic prostate cancer.

**Methods:** Thirty-five men with non-metastatic prostate cancer scheduled for EBRT were followed at baseline, midpoint, and completion of EBRT. The Functional Assessment of Cancer Therapy–

Fatigue scale was administered. Demographic and clinical data were obtained by chart review. Paired t-tests, correlations, general linear models, and logistic regressions were used to determine associations between fatigue scores and clinical data.

**Findings:** Red blood cells, hemoglobin, and hematocrit levels were highly intercorrelated and, therefore, were grouped as one composite variable termed *heme*. Heme levels at baseline and androgen-deprivation therapy (ADT) were significantly correlated with worsening of fatigue symptoms from baseline to midpoint and endpoint. ADT alone did not have a significant correlation with fatigue, but it indirectly affected fatigue levels by influencing heme markers as treatment progressed. These findings provide evidence that hematologic markers and the use of ADT assist in predicting radiation therapy-related fatigue and guide symptom management.

Li Rebekah Feng, PhD, is a group leader and clinical research fellow at the National Institute of Nursing Research in the National Institutes of Health in Bethesda, MD; Mei-kuang Chen, PhD, is a research associate in the Department of Psychology at the University of Arizona in Tucson; Nada Lukkahatai, PhD, RN, is an assistant professor in the School of Nursing at the University of Nevada in Las Vegas; Chao-Pin Hsiao, PhD, RN, is an assistant professor in the Frances Payne Bolton School of Nursing at Case Western Reserve University in Cleveland, OH; Aradhana Kaushal, MD, is a radiation oncologist in the National Cancer Institute at the National Institutes of Health; Lee Sechrest, PhD, is a consultant in the Department of Psychology at the University of Arizona; and Leorey N. Saligan, PhD, RN, CRNP, FAAN, is a tenure track investigator at the National Institute of Nursing Research in the National Institutes of Health. The authors take full responsibility for the content of the article. The study was supported, in full, by the Intramural Research Program of the National Institute of Nursing Research of the National Institutes of Health. The content of the article has been reviewed by independent peer reviewers to ensure that it is balanced, objective, and free from bias. No financial relationships relevant to the content of this article have been disclosed by the independent peer reviewers or editorial staff. Saligan can be reached at saligan@mail.nih.gov, with copy to editor at CJONEditor@ons.org. (Submitted January 2015. Revision submitted February 2015. Accepted for publication April 6, 2015.)

Key words: cancer-related fatigue; anemia; radiation therapy; prostate cancer

Digital Object Identifier: 10.1188/15.CJON.744-750

Cancer-related fatigue (CRF) is defined as a sense of tiredness that persists over time, interferes with activities of daily living, and is not relieved by adequate rest (Hall, Mishel, & Germino, 2014; Piper & Cella, 2010; Weis & Horneber, 2015). Fatigue during external beam radiation therapy (EBRT) has been reported to increase in severity during treatment (Fransson, 2010).

Current guidelines for prostate cancer recommend active surveillance, EBRT, androgen-deprivation therapy (ADT), and/or radical prostatectomy for clinically localized prostate cancer (Brawley, 2012). Although these treatments improve and

prolong patients' lives, side effects often persist long after treatment completion (Singer et al., 2012). Fatigue is among the most distressing symptoms experienced by people with cancer and negatively affects their daily activities, physical well-being and functionality, and relationships with others (Weis & Horneber, 2015). ADT, in particular, may play a role in anemia, which may contribute to fatigue (Guo, Li, & Bhasin, 2014).

The importance of predicting the risk of adverse events associated with cancer treatment cannot be understated; the clinical implications in personalizing cancer therapy and improving nursing care are of great importance. Therefore, the