Skeletal Muscle Mass Loss During Cancer Treatment: Differences by Race and Cancer Site

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OBJECTIVES: To examine skeletal muscle mass change in a racially diverse sample of patients undergoing cancer treatment, determine significant predictors of muscle mass loss, and explore the interaction of race and cancer site.

SAMPLE & SETTING: A retrospective analysis was conducted for 212 patients seeking treatment at a university hospital clinic.

METHODS & VARIABLES: Skeletal muscle mass index (SMI) was determined by computed tomography at the time of cancer diagnosis and with cancer treatment.

RESULTS: One hundred thirty-four patients (63%) had SMI loss with cancer treatment. Race and cancer site were found to be significant predictors of SMI loss. Compared to other racial groups, non-Hispanic Black (NHB) patients had the greatest SMI loss ($p < 0.001$) with cancer treatment. NHB patients with rectal cancer experienced the greatest SMI loss compared to patients of other races and cancer types.

IMPLICATIONS FOR NURSING: To improve survivorship care for patients with cancer, it is essential to develop strategies for assessing and managing skeletal muscle mass loss throughout treatment, particularly for NHB patients with rectal cancer.

KEYWORDS oncology; muscle mass; rectal cancer; race; non-Hispanic Blacks

***ONF*, *47*(5), 557–566.**

DOI 10.1188/20.ONF.557-566

Oncology researchers have turned their attention during the past decade to the growing burden of skeletal muscle mass loss, an important factor driving healthcare needs and cancer survivorship care (Chang et al., 2018; Rier et al., 2016; Shachar et al., 2016). Low skeletal muscle mass in patients with cancer has been related to toxicities from chemotherapy, overall survival rates, and disease-free survival (Antoun et al., 2013; Pamoukdjian et al., 2018; Prado et al., 2007; Shachar et al., 2016). Cancer-related research and treatment efforts have considered various causes for muscle loss in patients with cancer (Williams et al., 2019). The prevalence of low skeletal muscle mass, which is variously defined based on several cut-points, such as 52.4 cm^2/m^2 for men and 38.5 cm^2/m^2 for women (Prado et al., 2008), is known to vary widely across cancer types, with a range of 5%–89% (Rier et al., 2016). Sex also affects the risk of low muscle mass; more men (61%) than women (41%) have shown loss of muscle mass after the first line of chemotherapy (Choi et al., 2015). In addition, increasing age is known to be related to greater muscle mass loss among patients with cancer (Williams et al., 2019).

These issues are particularly important considerations in cancer survivorship care because low muscle mass has been directly related not only to cancer treatment toxicities but also to postoperative complications, longer hospitalizations, and higher cancer recurrence and mortality (Mei et al., 2016; Miyamoto et al., 2015; Prado et al., 2008, 2009; Simonsen et al., 2018; Villaseñor et al., 2012). In addition, the lowered physical function and frailty associated with cancer and its treatment are known to accelerate muscle mass loss (Ethun et al., 2017; Galvão et al., 2009; Handforth et al., 2014; Morishita et al., 2012), which, in turn, leads to reduced quality of life, increased fatigue