The Relationships Among Physiologic Variables, Quality of Life, and Fatigue in Patients With Multiple Myeloma

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Fatigue is a symptom with several possible etiologic factors related to disease and treatment, including low hemoglobin (hgb), nutritional deficiencies, cytokines, cachexia, tumor burden, anxiety, depression, sleep disturbance, physical activity, and unmanaged symptoms (Ahlberg, Ekman, Gaston-Johansson, & Mock, 2003; Morrow, Shelke, Roscoe, Hickok, & Mustian, 2005; Olson et al., 2008). Fatigue in cancer has been described as being unlike fatigue associated with normal physical or mental exertion, with distinct physical, sensory, affective, and cognitive components (Barnes & Bruera, 2002; Gutstein, 2001; Olson & Morse, 2005). A consequence of the disease and treatment, fatigue is a seemingly ubiquitous symptom that patients with multiple myeloma encounter along the illness trajectory. The purpose of the current study was to begin an investigation of factors related to disease that contribute to the development of fatigue in patients with multiple myeloma.

Although researchers have examined disease-related factors associated with cancer-related fatigue, none has expressly examined the factors in patients with multiple myeloma. Many researchers have focused on the association between hgb and fatigue (Ryan et al., 2007); however, the relationship between anemia and fatigue has not always been consistent, and the degree of anemia is not always correlated with severity of fatigue (Morrow, Andrews, Hickok, Roscoe, & Matteson, 2002; Olson et al., 2002). For example, patients who are not anemic and undergoing radiotherapy often are profoundly fatigued (Ahlberg, Ekman, & Gaston-Johansson, 2004). Furthermore, in many patients, fatigue can be a persistent symptom years beyond the completion of treatment (Bower et al., 2000; Collado-Hidalgo, Bower, Ganz, Cole, & Irwin, 2006).

Cancer and its treatment are associated with the release of inflammatory markers by immune and malignant cells (Schubert, Hong, Natarajan, Mills, & Dimsdale, 2007). The finding that symptoms such as fatigue, fever, depressed activity, and anorexia are induced by the infusion of cytokines has led clinicians and researchers to speculate about the role of cytokines in their development (Lee et al., 2004). In addition to influencing subjective symptoms, cytokines such as interleukin-6 (IL-6) and tumor necrosis factor (TNF) have been found to interfere with red blood...