

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

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**F**atigue 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

**Purpose/Objectives:** To investigate the relationships among physiologic variables, fatigue, and quality of life (QOL) in patients with multiple myeloma.

**Design:** Cross-sectional, descriptive, exploratory.

**Setting:** Outpatient ambulatory care clinics at a tertiary oncology center.

**Sample:** 56 patients with multiple myeloma were accrued consecutively via nonprobability sampling strategy.

**Methods:** Study participants completed the European Organisation for Research and Treatment of Cancer QLQ-C30 and the Functional Assessment of Cancer Therapy–Fatigue. Physiologic variables and demographic data were collected from patient charts.

**Main Research Variables:** Hemoglobin (hgb), C-reactive protein (CRP), fatigue, and QOL.

**Findings:** Statistically significant correlations were found among hgb and two measures of fatigue and QOL, as well as among CRP and two measures of fatigue and QOL. Regression analysis revealed that as soon as the effect of CRP was removed, hgb was no longer a significant predictor of fatigue or QOL.

**Conclusions:** Although significant relationships between hgb and fatigue and hgb and QOL were identified, CRP made a significant contribution to predicting the variance in fatigue and QOL, whereas hgb did not. The findings suggest that higher CRP is predictive of greater fatigue and lower QOL.

**Implications for Nursing:** Nurses play an integral role in the assessment and management of cancer-related fatigue. Greater understanding of the pathophysiology of fatigue may lead to progress in assessment and intervention, with the ultimate goal of reducing cancer-related fatigue and improving QOL.

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