Effects of Exercise on Fatigue, Sleep, and Performance: A Randomized Trial

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Patients with multiple myeloma (MM) often receive intensive multidisciplinary treatment and experience multiorgan complications as a result of their disease and treatment (Coleman, Coon, et al., 2003; Coleman, Hall-Barrow, Coon, & Stewart, 2003). At least 60% of patients with MM are anemic (hemoglobin [Hb] < 12 g/dl) at diagnosis (International Myeloma Foundation, 2011), and almost all become anemic during treatment, often requiring red blood cell (RBC) transfusions (Knight, Wade, & Balducci, 2004). In patients with MM, epoetin alfa has been shown to reduce transfusions and increase Hb during chemotherapy (Barlogie & Beck, 1993). Anemia contributes to fatigue, the most common and distressing symptom for patients with cancer, and is reported in 80% of patients receiving chemotherapy for cancer (Brizel, Dodge, Clough, & Dewhirst, 1999; Glaspy et al., 2001; Silber et al., 1998).

Cancer-related fatigue is multidimensional, subjective, perceived as abnormal and distressing, and inadequately relieved by rest. Fatigue may lead patients to abandon treatment and can be so overwhelming that some patients say they would rather die (Curt et al., 2000). Insomnia frequently is related to fatigue in patients with cancer (Berger & Farr, 1999; Bower et al., 2000). The increase in daytime sleep and fatigue decreases daytime physical activity, leading to physiologic deconditioning and diminished activity tolerance (Winningham et al., 1994). Aerobic exercise improves sleep for healthy individuals (Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991) and decreases fatigue for individuals with cancer (Dimeo, 2001). Therefore, exercise is recommended as an intervention for fatigue (Berger et al., 2010). A systematic review and meta-analysis reported that a set of 14 controlled trials of exercise after treatment had a significant positive impact, improving aerobic capacity and quality of life. Moreover, aerobic exercise combined with epoetin alfa helped alleviate anemia.