The World Health Organization (2010) defined depression as a common mental disorder that presents with depressed mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration. The problems can become chronic or recurrent and lead to substantial impairments in an individual’s ability to take care of everyday responsibilities (World Health Organization, 2010). Annually, major depressive disorder affects about 6.7% of the U.S. population, or 14.8 million Americans aged at least 18 years. For people aged 15–44 years, it is the leading cause of disability in the United States (National Institute of Mental Health, 2010).

Depression’s Impact on Survival in Patients With Cancer

In patients diagnosed with cancer, the rate of depression is disturbingly elevated, 2–5 times greater than in the general U.S. population. The reported prevalence of major depression in individuals with cancer varies, ranging from 0%–38% (Massie, 2004). Identifying and treating depression ultimately may enhance the patients’ quality of life. Evidence also has shown that patients with cancer and depression or depressive symptoms may have an elevated mortality rate. Depression can affect a patient’s likelihood of survival, according to a meta-analysis (Oncology Nursing Society, n.d.). Satin, Linden, and Phillips (2009) analyzed 26 studies, with a total of 9,417 patients, that examined the effects of depression on the progression of disease and survival of patients with cancer. The analysis found an increased risk of death in patients who reported more depressive symptoms than others, as well as in patients who had been diagnosed with a depressive disorder compared to those who had not. The relationship was not seen consistently in all studies analyzed, and some studies found only a weak relationship between depression and decreased survival. However, Satin et al. (2009) found that patients experiencing depressive symptoms were 25% more likely to die, and patients diagnosed with major or minor depression were almost 40% more likely to die. The strongest relationship was in the bone marrow and stem cell transplantation population. Multiple studies have demonstrated that depressed mood prior to transplantation was associated with shorter survival times even after the researchers controlled for relevant medical factors (Andrykowski, Brady, & Henslee-Downey, 1994; Cassileth, Walsh, & Lusk, 1988; Colon, Callies, Popkin, & McGlave, 1991; Satin et al., 2009).

Psychological factors such as depression, anxiety, and stress can have negative physiologic effects on cancer progression (Andrykowski et al., 1994; Antoni et al., 2006; Cassileth et al., 1988; Colon et al., 1991; Satin et al., 2009). The mechanisms of the association still are being researched, but depression has been linked with declines in natural killer cell activity (Irwin & Miller, 2007; Levy, Lee, Bagley, & Lippman, 1988), an increase in catecholamines (Lutgendorf et al., 2005), and the release of angiogenic cytokines promoting angiogenesis (Irwin, Clark, Kennedy, Christian Gillin, & Ziegler, 2003), all of which are associated with tumor growth and cancer progression (Thaker et al., 2006).

Even with the epidemiologic and physiologic evidence supporting the link between depression and decreased survival, the causal variable is not known. Does depression cause the progression, or is depression the consequence of the tumor’s manipulation of the body and the physiologic changes? Akechi et al. (2000) suggested a bidirectional relationship between depression and cancer.

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An additional way depression can increase mortality risk is that patients with cancer who are depressed are more likely to commit suicide than nondepressed patients (Spiegel & Giese-Davis, 2004). Studies have suggested that although relatively few patients with cancer commit suicide, the incidence of suicide is at least equal to the incidence in the general population and may be 2–10 times higher in some higher-risk subgroups (Akechi et al., 2000; Bolund, 1985a, 1985b).

**Depression’s Effects on Adherence to Therapy**

Nurses must consider the effects of depression in the context of adherence to oral therapies. Nonadherence may affect tumor response or effective symptom management. For example, women with hormone-responsive early breast cancer increase the risk of cancer recurrence by almost 50% if they do not take hormone therapy pills for five years (Partridge, Avorn, Wang, & Winer, 2002). Partridge et al.’s (2002) review of research on nonadherence by patients with cancer found that almost 80% failed to strictly follow their prescription regimens. Compared with nondepressed patients, depressed patients are three times more likely to be noncompliant with medical treatment (Partridge et al., 2002).

**Depression and Cardiac Issues in Survivorship**

In addition, the physiologic effects of depression extend into survivorship. A late effect that causes great concern is potential treatment-related cardiac toxicity. Cardiac risks affect patients with lymphoma, leukemia, breast cancer, testicular cancer, and a host of other malignancies. The Adult Survivorship Clinic at the Dana-Farber Cancer Institute tries to frame the discussion of risks related to therapy and reduction of such risks as modifiable versus nonmodifiable factors.

Prior therapy, family history (genetics), gender, and age cannot be changed; worrying about those issues, although understandable, may cause increased anxiety and depression. Comorbidities and lifestyle choices such as hypertension, diabetes, hyperlipidemia, poor diet, smoking, and lack of exercise are known to increase the risk of cardiotoxicity in patients receiving chemotherapy (DiMatteo, Lepper, & Croghan, 2000). In comparison with age-matched controls, previously healthy cancer survivors tended to develop more comorbidities and reduced physical activity (De Bruin et al., 2009; Jones, Haykowsky, Swartz, Douglas, & Mackey, 2007; Minotti, Menna, Salvatorelli, Cairo, & Gianni, 2004). Therapeutic lifestyle changes have an important beneficial effect on cardiovascular morbidity and mortality, and the standard recommendation is that therapeutic lifestyle changes should be an integral component of any secondary prevention program (Vaughn, Palmer, Carver, Jacobs, & Mohler, 2008). Successful adjustment of modifiable risk factors lowers a patient’s risk of developing heart disease. Healthcare providers and patients should focus on identifying modifiable risk factors for heart disease and developing a plan to reduce their risks. An additional risk factor that should enter this discussion is depression.

In cardiology, the evidence regarding depression’s causal relationship with cardiac disease is stronger. Individuals with depression are more likely to develop ischemic heart disease (IHD) than are individuals without depression (see Figure 1). Depression is a primary risk factor for IHD, independent of other conventional risk factors (Iestra et al., 2005). Patients with cardiomyopathy (heart failure) who were depressed had a higher mortality rate (Rugulies, 2002). Several physiologic hypotheses may explain the influence of depression on cardiac disease. The author has found mental stress–induced myocardial ischemia (MSIMI) interesting because of the amount of clinical and research data to support it. Articles have demonstrated consistently that mental stress testing elicits myocardial ischemia in patients with documented IHD. MSIMI is defined by wall motion abnormality and reduced ejection fraction (Gullette et al., 1997; Jiang et al., 1996; Rutledge, Reis, Linke, Greenberg, & Mills, 2006).

Most healthcare providers are familiar with exercise-induced ischemia; MSIMI differs in a few important ways. Mental stress causes a significant rise in diastolic blood pressure but just a small increase in heart rate (Rutledge et al., 2006). Exercise testing produces a smaller evaluation in diastolic blood pressure but a rather dramatic increase in heart rate. MSIMI occurs silently and rarely shows ischemic electrophysiology changes. Mental stress causes more left ventricular dysfunction, and the severity is greater (Rozanski et al., 1988). Furthermore, depression is associated with MSIMI (Blumenthal et al., 1995; Jiang et al., 2003).

Cardiology has attempted to gain insight into how to approach this paradigm. Clinical trials have explored whether treating depression can reduce myocardial ischemic activity in patients with ischemic heart disease. Several nonrandomized studies have shown a cardiovascular benefit of stress reduction and enhanced social support after myocardial infarction (Lichtman et al., 2008). However, although psychotherapy and drug therapy improved depressive symptoms, they did not affect cardiovascular outcomes in randomized trials (Lichtman et al., 2008).

**Conclusion**

Many patients with cancer may experience depression, which might affect their...
References


*Safety provides readers with information on safety issues affecting patients with cancer and those caring for them. Length should be no more than 1,000–1,500 words, exclusive of tables, figures, insets, and references. If interested, contact Associate Editor Camille A. Servodidio, RN, MPH, CRNO, OCN®, CCRP, at cservod@harthosp.org.*

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