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Review

The role of integrative oncology in a tertiary prevention survivorship program

Stephen M. Sagar [a,b,*], Brian D. Lawenda [c,d]

[a] Department of Radiation Oncology, 3rd Floor, Juravinski Cancer Centre, Hamilton, Ontario, Canada L8V 5C2
[b] Departments Oncology and Medicine, McMaster University, Hamilton, Ontario, Canada L8V 5C2
[c] Uniformed Services University of the Health Sciences, Bethesda, MD, USA
[d] Department of Radiation Oncology, Indiana University School of Medicine, Indianapolis, IN, USA

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ABSTRACT

Objective. Since 64% of cancer patients survive more than 5 years beyond diagnosis, oncologists are challenged to expand their focus from acute care to managing the long-term health consequences of cancer treatment and ensuring the integration of cancer prevention into their practices. This review defines the cancer prevention role of integrative oncology as a key component in survivorship programs.

Methods. A narrative review consisting of the results of preclinical studies, randomized controlled trials and systematic reviews that may contribute to cancer prevention.

Results. Integrative oncology focuses on the complexities of health and proposes a multitude of approaches. Its categories are mind–body techniques, physical therapies, nutrition plus supplements, and botanicals or natural health products. Behavioral modification, through selected integrative oncology interventions may enhance cancer prevention.

Conclusion. Opportunities exist for oncologists to promote lifestyle changes that improve patients' length and quality of life. Integrative oncology utilizes techniques for self-empowerment, individual responsibility, and lifestyle changes that could potentially reduce both cancer recurrence and second primary tumors. Education in the principles of integrative oncology and evidence-based complementary therapies is lacking. There is a need for studies on cost-utility and effectiveness of whole systems programs of integrative oncology for the tertiary prevention of cancer.

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Introduction

The National Coalition for Cancer Survivorship (NCCS) defined a survivor from the time of cancer diagnosis to end of life. More than 10 million people are now cancer survivors (American Cancer Society, 2007), (Fig. 1). This population is not only at risk of developing long-term adverse effects of cancer treatment, but it is also at risk of developing a cancer recurrence or a new cancer diagnosis. Cancer prevention strategies have been defined by the American Society of Clinical Oncology Cancer Prevention Committee (ASCO CAPC) as "a reduction in the risk of developing clinically evident cancer, whether first or second primary cancer, or of developing intraepithelial neoplasia (IEN), a frequent cancer precursor." (Lippman et al., 2004). Many survivors are at risk of second cancers as a consequence of genetic predisposition, previous lifestyle, psychological trauma and

* Corresponding author. Department of Radiation Oncology, 3rd Floor, Juravinski Cancer Centre, Hamilton, Ontario, Canada L8V 5C2.
E-mail address: stephen.sagar@jcc.hhsc.ca (S.M. Sagar).

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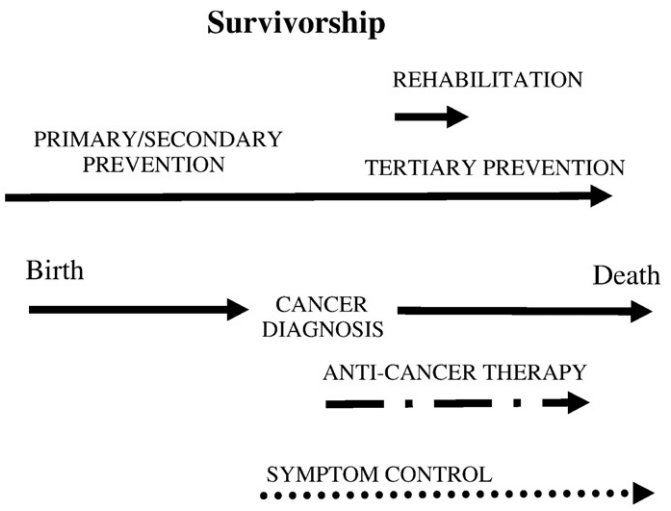

Fig. 1. Survivorship periods.

future lifestyle, as well as some anti-cancer therapies. Lack of lifestyle modification plays a very significant role in the development of new cancers, and may be a factor in the relapse of previously treated disease (Courneya, 2003; Emmons et al., 2002; Maunsell et al., 2002; Meyerhardt et al., 2006a,b). This article focuses on tertiary prevention, that is interventions that can reduce the negative impact of an already established disease by restoring function and reducing disease-related complications, including cancer recurrence and second primary cancers.

Integrative oncology utilizes techniques for self-empowerment, individual responsibility, and lifestyle changes that could potentially reduce both cancer recurrence and second primary tumors. Integrative oncology is both a science and a philosophy that focuses on the complexity of health of cancer patients and proposes a multitude of approaches to accompany conventional therapies to facilitate health (Sagar and Leis, 2008b). It incorporates the best of all health care systems so long as they have been demonstrated to be safe and effective according to rigorous evidence-based principles. Integrative healthcare seeks—through a partnership of patient and practitioner—to treat the whole person, to assist the innate healing properties of the individual, and both to promote health and wellness and to prevent disease. It employs a collaborative team approach guided by consensus-building, during which the various practitioners and the patient contribute their particular knowledge and skills. It aims to provide a more effective and cost efficient care plan by synergistically combining therapies and services in a manner that exceeds the collective effort of the individual practices (Boon et al., 2004).

Interventions can broadly be categorized into mind–body, physical, nutrition and supplements, and botanicals. Evidence-based complementary therapies used in integrative oncology are reviewed in detail elsewhere (Sagar, 2006; and Abrams and Weil, 2009). This article focuses only on their rationale and application to preventive medicine in a survivorship program.

Mind–body approaches

Patients with cancer experience a multitude of behavioral alterations that include depression, fatigue, sleep disturbance, and cognitive dysfunction which persist well into the survivorship period, resulting in impaired quality of life, reduced treatment adherence, and increased disease-related morbidity and mortality (Miller et al., 2008). Although negative behaviors (e.g., cigarette smoking, alcohol use, and unhealthy dietary practices) associated with psychosocial stress may partly explain lower survival rates in distressed individuals, it is possible that stress-induced immunosuppression or dysregulation could also be a contributor, particularly in patients with immunogenic tumors (Yang and Glaser, 2003). For example, in ovarian cancer patients, depressed and anxious mood is associated with a greater impairment of the cellular immune response, and an increase in tumor progression through induced matrix metalloproteinase (MMP-2) and vascular endothelial growth factor (VEGF) (Lutgendorf et al., 2008; Sood et al., 2006). Stress can be a co-factor for the initiation and progression of cancer. The catecholamine stress hormone, norepinephrine (NE), may influence tumor progression by modulating the expression of factors (i.e. VEGF, MMP-2, etc.) implicated in angiogenesis and metastasis (Yang et al., 2008a,b, 2006 and Madden, 2003). Psychological distress reduces the efficacy of chemotherapy in breast cancer patients (Su et al., 2005) through mechanisms that may be related to altered neuronal or hormonal secretions during stress.

Relaxation is associated with a reduction in the stress-induced psychological or physiological responses through modulation of cytokines and other mechanisms (Bong et al., 2008). Relevant cognitive-behavioral strategies include enhancement of coping skills, relaxation training, meditation, graded exercise, yoga, tai chi, and other mind–body interventions that induce the relaxation response and treat insomnia (Sagar, 2006; Abrams and Weil, 2009; and Miller et al., 2008). Conditioning could be expected to influence CNS–immune system interactions that influence the precipitation or progression of the disease (Ader, 2003; Bovbjerg, 2003; Ader and Cohen, 1975). Although there are certainly short-term benefits for psychological distress reduction, there is a need for more research that evaluates long-term outcomes. For example, an intervention that included strategies to reduce stress, improve mood, alter health behaviors, and maintain adherence to cancer treatment and care showed a significant lowering of anxiety, improvements in perceived social support, improved dietary habits, and a reduction in smoking. Immune responses for the intervention patients paralleled their psychological and behavioral improvements (Andersen et al., 2004; Andersen et al., 2008).

Social isolation is associated with an increased risk of death from cancer (Hawkley and Cacioppo, 2003). Early intervention with support groups and social connection could be beneficial in multiple ways that include mutual coaching, information exchange, as well as the apparent physiologic effects on immunity. Consistent with the argument that the physiological effects of loneliness have a long time course, a prospective study of breast cancer survivors revealed that levels of social integration before breast cancer diagnosis predicted physical functioning and overall vitality during the 4 years following diagnosis (Michael et al., 2002). A recent large-scale prospective study of breast cancer patients reported that neither stress nor lack of social intimacy alone was related to development of breast cancer, but the combination of low social intimacy along with high levels of life stress predicted it (Price et al., 2001). Similarly, the combination of depression and cigarette smoking produced greater natural killer (NK) cell decrements than did either factor alone (Jung and Irwin, 1999).

Approaches to improved survivorship will often be a combination of psychological attitude and behavioral change; it is undesirable to separate the two. Whole systems approaches are an intriguing direction. This type of mixed intervention approach requires more study but may have the advantages of additive, or even synergistic effects, and is more true to the real world scenario (Ornish et al., 2005).

Exercise and physical approaches

Cancer and its treatment increase the risk of further cancers as well as other chronic diseases, such as diabetes, cardiovascular disease, and osteoporosis (U.S. Department of Health and Human Services, 1996). Physical activity has been proposed as a nonpharmacologic intervention to combat the physiologic and psychologic effects of treatment in