Part I: Cancer Incidence in Canada

Incidence refers to the number of new cases of a particular disease or condition in a given year. The following information is taken from Canadian Cancer Statistics, an annual joint publication of the Canadian Cancer Society and Statistics Canada.[1] In general, incidence rates have been slowly increasing in Canada, although in theory this could be explained in part due to better detection and an aging demographic, rather than an increased risk of cancer.

It is estimated that 2 in 5 Canadians will develop cancer at some point in their lives.[1] For the year 2013, it was estimated that 187,600 new cases would be diagnosed, and that just over half of these cases would be from prostate, breast, lung, and colorectal cancer. Men have a slightly increased risk of developing cancer in their lifetime. It is estimated that 46.6% of men, or 1 in 2.2, will develop cancer in their lifetime, compared to the lifetime probability in women, which is 41%, or 1 in 2.4. When age is taken into account, 88% of new cancer diagnoses are in those over the age of 50, and 1% of new cases are between the ages of 0 and 19. The Atlantic provinces and Quebec have higher incidence rates than the rest of Canada, and the trend declines from east to west, with British Columbia having the lowest rates.[1]

The probability of developing cancer is multifactorial and also depends on the type of cancer. For example, it is estimated that 1 in 7 men will be affected by prostate cancer, and 1 in 9 women will be affected by breast cancer in their lifetime.[1] Lung cancer is declining in males, likely due to decreased tobacco use. Stomach cancer is also declining in both males and females, thought to be due to improvements in diet, reduced tobacco and alcohol use, and recognition of *H. pylori* as a risk factor. However, liver and thyroid cancers have increasing incidence rates among both males and females.

Incidence rates are important to collect as they can help to predict the future health burden on the population at large, and ensure adequate testing and treatment services are available. In addition, they can help to inform where prevention efforts should be
focused, and what supportive care may be required. The following series will discuss naturopathic perspectives on complementary cancer strategies.

References

Cancer

An Introduction to a Naturopathic Perspective

Part II: Importance of Exercise for Early Stage Breast and Prostate Cancer

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Extensive research has been published with respect to physical activity and cancer. In fact, physical activity has been proposed as the lifestyle factor most strongly and consistently associated with both breast cancer incidence and recurrence.[1] One study asked women diagnosed with early stage breast cancer about their physical activity level after their diagnosis. Those that exercised more than one hour per week showed a reduction in cancer related mortality, with the greatest benefit seen in those who walked 3–5 hours per week.[2]

Many other studies have shown a positive correlation between physical activity and disease-free survival in breast cancer.[3, 4] Of particular clinical relevance is the timing of physical activity. One study looked at the change in physical activity from before to after diagnosis, and showed that women who maintained or increased their physical activity level to three hours or more per week had 33% less risk of death, even if they were inactive before their diagnosis.[5]

With respect to prostate cancer, research shows no clear link that exercise may be preventative. However, there is consistent data showing that obesity is a risk factor for developing the disease.[6] One of the clearest benefits of exercise for prostate cancer is its efficacy for improving many of the adverse effects associated with treatment.
Common conventional treatment is androgen deprivation therapy (ADT), which drastically reduces testosterone levels resulting in many distressing side effects, such as sexual dysfunction. One study showed that a 12-week trial of aerobic and resistance training maintained current levels of sexual activity in men undergoing ADT, while those who did not exercise had reduced sexual activity.[7]

Like breast cancer, physical activity after prostate cancer diagnosis has been shown to prevent disease progression and increase survival. One study showed that three hours or more per week of vigorous activity was associated with 61% lower risk of death compared to men who exercised less than one hour per week.[8] Vigorous activity was defined as biking, tennis, jogging, or swimming. Another study showed similar results with brisk walking, with those who participated in more than three hours per week having a 57% lower rate of progression compared to those who walked at an easy pace for less than three hours per week.[9]

We will explore physical activity and weight loss with respect to advanced cancers in part III of this article.

References

It is common for late stage patients undergoing treatment to lose weight. Cachexia is characterized by an ongoing loss of skeletal muscle mass due to abnormal metabolism and protein catabolism, thought mostly to be associated with chronic inflammation. Importantly, it is not due to reduced food intake and therefore cannot be primarily managed in such a way, although nutrition is still very important. A comprehensive treatment approach to cachexia should encompass maintaining muscle mass, optimizing nutritional intake and reducing inflammation.

In contrast, malnutrition can also cause weight loss, which is a deficiency of energy, protein and other nutrients mostly as a result of reduced food intake. Malnutrition can exist due to mucositis, nausea, vomiting, and pain. As such, nutritional interventions have been shown to combat weight loss with good success in patients who are malnourished.

As discussed in part II, there is ample research with respect to the benefits of exercise in early stage cancers, but unfortunately there is a paucity of research that has looked at exercise in advanced cancer patients and those with cachexia. One study in stage IV patients did show that an exercise regimen of 60 minutes twice per week for eight weeks increased muscle strength, as measured by hand grip strength, and the researchers concluded that exercise is a feasible and beneficial aspect of care.[1] In advanced cancers, a reduction in physical activity is linked to impaired quality of life.[2]

Exercise has a directly beneficial effect on increasing or maintaining muscle mass, increases the immune response and decreases some markers of inflammation.[3] Both aerobic exercise and resistance training increase muscle mass and strength.[3] Low muscle mass is associated with increased risk of dose-limiting chemotherapy toxicities, such as low white blood cell count and reduced overall survival, and therefore it is extremely
important to maintain muscle mass in advanced cancers. If patients do commence a daily exercise regimen, it has been suggested that they increase their protein intake to 1.0–1.5 g/kg/d, and caloric intake should increase by 300–400 kcal/d.[4]

Of utmost clinical importance is the issue of weight stabilization even in overweight advanced cancer patients. Cachexia has the potential to be under recognized in the face of the obesity epidemic as muscle mass loss is harder to detect in larger individuals.[2]

Monitoring both body weight and composition are important aspects of an ongoing clinical assessment in advanced cancer patients, and should be measured at every visit regardless of the appearance of obvious wasting often associated with cachexia. This is because once at this stage, it is less amenable to reversal.[5]

References

Cancer

An Introduction to a Naturopathic Perspective

Part IV: High-Dose Intravenous Vitamin C and Cancer

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Vitamin C is an important antioxidant and contributes to the functioning of the immune system. Oral vitamin C is commonly taken during cold and flu season, but intravenous vitamin C (IVC) is becoming more common as a treatment for cancer. When given intravenously, the concentration of vitamin C reaches magnitudes not possible when taken orally, and without adverse effects.

There are numerous reasons IVC may be beneficial during cancer treatment. First, it plays a role in collagen production and may protect normal tissue from tumor invasiveness or metastasis. Second, it has been shown that vitamin C levels are profoundly depleted in cancer patients, which correlates with higher levels of inflammation. Third,
despite its controversy in mainstream medicine that antioxidants counteract chemotherapy, at the high concentrations achieved intravenously, vitamin C acts as a prooxidant and is toxic to tumor cells. Fourth, vitamin C can inhibit tumor angiogenesis, the process of new blood-cell formation crucial to tumor survival. And fifth, patients given IVC concurrently with standard chemotherapy report less fatigue, nausea, depression, sleep disorders, improved appetite, and improved overall wellbeing.[1]

There are many clinical trials that show promise for certain cancer types. Pancreatic cancer is unfortunately often diagnosed at stage IV and therefore has high mortality rates. Several recent studies have shown that IVC together with conventional chemotherapy had high tolerability and a high response rate.[2, 3] A study of stage II and III breast cancer patients showed a significant reduction of disease-related complaints induced by chemotherapy and radiotherapy.[4] Cell studies have shown that vitamin C is toxic to prostate cancer,[5] non-small cell lung cancer,[6] and colon cancer cells,[7] while animal studies have shown that it may have some efficacy in the treatment of melanoma[8] and mesothelioma, the latter being notoriously difficult to treat.[9]

Of important clinical application is the potential use of IVC in palliative care. In a small study of terminally ill patients, infusions of vitamin C were given twice per week for a week, together with oral vitamin C. Quality of life scales were completed both before and after treatment, and indicated that patients reported better overall physical, emotional and social functioning, as well as decreased disease symptomatology, including fatigue, nausea/vomiting, pain, sleep disturbance, and loss of appetite.[10] This is important because quality of life is just as important as cure in terminal cancer patients.

References

