Prostate Cancer: Diet

Description/Etiology
Prostate cancer is a carcinoma that begins in the prostate gland, which is a walnut-sized secretory gland in the male reproductive system that surrounds the urethra. Because prostate cancer grows slowly, it is frequently found during routine screening before any noticeable signs and symptoms develop. If prostate cancer is not diagnosed until a later stage, it can inhibit the flow of urine in the urethra and metastasize, causing pain in the lower back and pelvic bone. Treatment depends on the stage of the cancer at diagnosis, and the age and health of the patient. Treatment options for prostate cancer include surgery, chemotherapy, hormone therapy, and radiation therapy. (For more information on prostate cancer and its treatment, see the series of related Quick Lessons and Evidence-Based Care Sheets.)

Research results show that overweight and obese individuals are at greater risk for cancer, and unhealthy weight gain is associated with more severe and progressive prostate cancer. Evidence suggests that achieving and maintaining a healthy weight, engaging in regular physical activity, and consuming a healthy diet are effective in reducing the risk of developing cancer. The diet recommended for cancer prevention, including preventing recurrence, is a diet that is low in saturated fat, high in fiber, and includes fish, other lean proteins, and a wide variety of fruits and vegetables.

Drastic dietary changes (e.g., high doses of vitamins or large quantities of fruits and vegetables) are not usually recommended for the treatment of cancer. In some cases, high doses of nutrients interfere with cancer treatment. Extreme fat restriction may also be harmful during treatment for cancer because the body typically requires increased calories when under stress. There is some evidence that the adoption of a plant-based diet combined with stress reduction can slow the progression of prostate cancer and potentially play a therapeutic role in the clinical management of patients with recurrent prostate cancer.

Facts and Figures
In the United States, cancer is second only to heart disease as a cause of mortality. Prostate cancer is uncommon in men who are under 50 years of age, but it is the second highest cause of cancer-related death in men, and the most common cause of death in men who are over 75 years of age. (Heidenriech et al., 2012)

Risk Factors
Black men are at greater risk for prostate cancer than men in other demographic populations. Other risk factors for prostate cancer include being over 60 years of age; family history of prostate cancer; exposure to Agent Orange or cadmium; being a farmer, tile plant worker, or painter; excessive alcohol use; and consuming a high-fat diet, especially a diet that is high in animal fat.

Signs and Symptoms/Clinical Presentation
Signs and symptoms of prostate cancer include straining when urinating, delayed start of urination, slow urinary stream, urine leakage, blood in the urine or semen, and inability to void. When prostate cancer has spread, bone pain is present in the lower back and pelvic bones.
Nutritional Assessment

› **Patient Medical History**
  • Ask about the following:
    – Personal and family history of cancer
    – Other medical conditions (e.g., thyroid disorder, diabetes mellitus, heart or renal failure)
    – Symptom onset and characteristics, if any, which can have a negative effect on dietary intake (e.g., vomiting, diarrhea, constipation, pain, fatigue, headaches)
    – Level and type of regular physical activity

› **Patient Dietary History**
  • Conduct a diet analysis by asking the patient to complete a diet history
    – Useful tools for evaluating the patient’s dietary strengths and weaknesses include a food frequency questionnaire and a 3-day diet recall (i.e., patient recall of all foods and beverages consumed in a 3-day period that includes 1 weekend day)
  • Ask about personal habits, including alcohol, caffeine, and soda consumption; smoking; eating at night; and frequenting vending machines or fast food
  • Ask about anxiety and depression, which are common in patients with cancer and can interfere with dietary intake

› **Anthropometric Data**
  • Calculate the patient’s BMI by dividing body weight (kilograms) by height (meters squared) or 703 multiplied by weight (pounds) and divided by height (inches squared)
    – Underweight: < 18.5; **normal:** 18.5-24.9; overweight: 25-29.9; obese: ≥ 30

› **Laboratory Tests and Diagnostic Tests of Particular Interest to the Dietitian**
  • CBC with Hgb/Hct is usual to assess for anemia, malnutrition, and infection

Treatment Goals

› **Promote a Healthy Lifestyle, Relieve Cancer-related Symptoms, and Educate**
  • Review results of laboratory tests and diagnostic studies used to assess for or monitor complications; and report nutritional status-related findings to the treating clinician as they are obtained
  • Evaluate for gastrointestinal discomfort (e.g., nausea/vomiting/diarrhea/constipation) and adjust dietary recommendations accordingly
  • Review diet history information to assess dietary intake and patterns, and provide detailed patient education regarding the effect of diet, exercise, and other lifestyle factors on cancer and its recurrence. (For more information, see What Do I Need to Tell the Patient/Patient’s Family?, below)
  • Provide detailed education on following a nutritious diet designed to prevent and/or treat prostate cancer, including
    – a low-fat diet
    – increased consumption of fruits and vegetables
    – avoidance of high caloric intake
    – avoidance of excessive meat intake
    – avoidance of excessive dairy product and calcium intake
    – meal planning
    – shopping for food
    – taking supplemental vitamins, only if indicated
    – strategies for reducing risk of cancer recurrence
  • Assess patient/family mental status for anxiety and depression; provide emotional support and request a mental health clinician referral for counseling on coping strategies if appropriate, or if necessary clinicians are not already part of the treatment team

Food for Thought

› A substantial amount of evidence has accrued demonstrating the protective role of dietary phytochemicals (i.e., beneficial, plant-derived substances) against certain cancers, including prostate cancer
  • Results of numerous in vitro and animal studies show an inverse association between the tea constituent catechins, the most active of which is epigallocatechin-3-gallate (EGCG), and the cell growth of certain cancers. EGCG has demonstrated the ability to inhibit DNA methyltransferases (DNMTs) in human prostate cancer cells (Tan, et al., 2011)
  • Genistein, found primarily in soybeans, is an isoflavone from the flavonoid class of polyphenol compounds. Results of studies show that the estrogen-like compound genistein appears to inhibit prostate cancer through its ability to affect
histone acetylation and DNA methylation. In addition, results of a systematic review on soy and prostate cancer risk demonstrated that total soy intake is significantly associated with a reduced risk of developing prostate cancer. Tofu was the soy food most frequently consumed in the studies examined (Applegate, et al., 2018)

- Resveratrol, a non-flavonoid polyphenol found in bilberries, blueberries, cranberries, peanuts, and the skin of red grapes, has demonstrated antiproliferative properties in prostate cancer cells. Study results show that resveratrol is able to impact signaling pathways that regulate cellular division, growth, apoptosis, angiogenesis, and tumor metastasis (AICR)
- There is evidence that curcumin increases the chemosensitivity and radiosensitivity of tumors, decreases cancer-causing inflammation, and promotes apoptosis in rapidly reproducing cancer cells, while providing protection for other tissues and the internal organs. By inhibiting DNMT activity and acting as a histone modifying compound, curcumin prevents and combats prostate cancer (Jordan et al., 2016)
- Results of numerous studies show an inverse association between coffee consumption and certain cancers, including prostate cancer. Researchers note that this protective effect appears to be related to the phytoneutrients provided by coffee (e.g., caffeic and chlorogenic acids) rather than the caffeine content. According to authors of the European Prospective Investigation into Cancer and Nutrition (EPIC) study, coffee accounted for 55.3-80.7% of total phenolic intake among the study participants and was their primary food source of phenolic acids (Zamora-Ros, et al., 2013)
- The carotenoid compound lycopene has been examined in the prevention and treatment of prostate cancer. In a recent systematic review and meta-analysis, researchers determined that both raw and cooked tomatoes may play a modest role in prostate cancer prevention. Compared to those who ate little or no tomatoes, those with higher intake and higher serum lycopene have a 1% relative risk reduction in the risk of developing prostate cancer (Chen et al., 2013)

Current recommendations for the prevention and management of prostate cancer with diet include consumption of a diet low in fat, high in fruits and vegetables, avoidance of high calorie intake, of excessive meat intake, and high dairy and calcium intake (Ma & Chapman, 2009)

Red Flags

- Although many patients are interested in starting a neutropenic (i.e., sterile or low-microbial) diet when diagnosed with cancer, results of studies do not show symptom improvement, prevention of infection, or increased survival in patients on such diets
- Taking very high doses of vitamins is contraindicated during treatment for cancer because evidence suggests that it could interfere with treatment

What Do I Need to Tell the Patient/Patient’s Family?

- Achieve and maintain a healthy weight to reduce the risk of cancer recurrence
- Adequate calorie and nutrient intake is important. If experiencing strong food aversions, eating small, frequent meals of food with bland flavors may be more manageable
- As tolerated, eat a diet that is high in fiber and low in fat that includes fish and other lean sources of protein, unsaturated fats, whole grains, legumes, and a wide variety of fruits and vegetables
- Limit alcohol consumption to two drinks/day
- Participate in regular physical activity as tolerated, if medically appropriate
- Do not use tobacco
- Obtain more information on prostate cancer, diet, and supplements from the National Cancer Institute at http://www.cancer.gov/about-cancer/treatment/cam/patient/prostate-supplements-pdq
- Obtain more information on making healthy lifestyle changes at the U.S. National Center for Complementary and Integrative Health (NCCIH) at (888) 644-6226, or visit https://nccih.nih.gov/

Discharge Planning

- Eat a calorie-appropriate diet that includes fish and other lean proteins, unsaturated fats (including omega-3), complex carbohydrates (e.g., whole unrefined grains), legumes, nuts and seeds, and a variety of fruits and vegetables
- Eat small, frequent meals with nutrient dense foods for better food tolerance and energy maintenance
- Choose high fiber foods and drink adequate water to prevent or relieve constipation
- If nauseated, choose mildly flavored, cold foods for better tolerance
- If unable to consume adequate calories, fortify foods with whole milk or protein supplements and encourage high-calorie snacks
- Take dietary supplements only as prescribed
As tolerated, participate in regular physical activity for at least 150 minutes/week, including strength training at least 2 days/week

Recruit the help of family and friends to assist in meal planning, grocery shopping, and food preparation

References

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