Diet for Patients with Colorectal Cancer

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Introduction
In the UK in 2004 36,000 people were diagnosed with colorectal cancer and it accounted for 16,000 deaths (1). Between the 1970’s and mid 1990’s there was an increase in the incidence for colorectal cancer but a decline in mortality rates (2). The increased incidence could be explained by increased awareness and earlier diagnosis of colorectal cancer.

People with cancer are at high risk of nutritional depletion because of the physical and psychological effects of both the treatment and disease. Quite often, patients have endeavoured to follow a healthy diet prior to their diagnosis, particularly if they have conditions such as cardiovascular disease or diabetes, and are confused when told to have high calorie foods, advice which contradicts public health messages.

Alternative and complementary diets and their role in cancer gains a lot of media attention and these messages can conflict with those given by health professionals. Patients with cancer view nutrition as an important component of their cancer therapy (3) and therefore it is imperative for individuals working in cancer services to have an appreciation of issues which relate to this.

Dietary Risk Factors for Colorectal Cancer
In the case of colorectal cancer, diet may reduce the risk of developing this disease; however, research to date has not uncovered a definitive effect and has left areas of uncertainty. There is evidence that dietary fibre may play a preventative role against the development of colorectal cancer. A good intake of fibre, defined in the UK as 18g a day, is recognised as beneficial for health (4). Fibre obtained from fruit and vegetables have the added benefit of providing protective antioxidants (5). High intakes of red and processed meats may be linked to an increased risk of developing colorectal cancer. This is thought to be due to cooking the meat at high temperatures resulting in the formation of carcinogenic compounds. Preserved meat is regarded as more detrimental than fresh meats due to high nitrite levels which may be converted in the colon to carcinogenic N-nitroso compounds (5).

Increased body weight could be a risk factor for colorectal cancer and therefore it is recommended to maintain weight within a healthy body mass index (BMI) range of 18.5 to 25kg/m² (5). Physical activity is a protective factor in colorectal cancer. A varied diet using a variety of protein sources and a good supply of fruit and vegetables (400g a day) is probably protective against colorectal cancer (5).

Nutritional Status of colorectal cancer patients
DeWys et al reported the incidence of weight loss in colorectal cancer patients to be 54% (6). Malnutrition is observed in up to 80% of patients with advanced colorectal cancer and is associated with longer hospital stay, reduced response and increased complications to anticancer therapy, increased overall cost of care and poor survival (7). Early detection of nutritional problems and timely intervention is important whether the goal of cancer treatment is cure or palliation.

There are multiple factors involved in the development of malnutrition in cancer. Weight loss may be due to physiological abnormalities associated with the tumour, such as malabsorption, obstruction, diarrhoea and vomiting. Cancer cachexia, an extreme continuum of weight loss in cancer, can be defined as a complex, multifactorial syndrome characterised by anorexia, generalised host tissue wasting, skeletal muscle wasting, immune dysfunction and tumour induced metabolic aberrations (8). Psychosocial factors such as depression, anxiety and learned taste aversions also contribute to difficulty with eating and to weight loss. Anticancer treatments can negatively impact on nutritional status. Patients with colorectal cancer may require more than one treatment (multi modality treatment) lasting for a number of months. It is important to remember that patients treated in this way will have the combined side effects from each of the treatments and this can put them at even greater risk of weight loss and malnutrition.

Surgery
St Thomas’ Hospital is running an Enhanced Recovery Programme (ERP) for elective colorectal surgery as outlined by Fearon et al (9). Enhanced Recovery after Surgery (ERAS) refers to a number of strategies that when initiated together can improve recovery and reduce length of hospital stay. These include changes to operative environment, surgical technique, analgesia and post operative rehab.

Nutrition used within the ERP aim to reduce post operative metabolic stress, leading to a reduction in postoperative insulin resistance and hyperglycaemia and allows for better nitrogen balance. ERP incorporates nutritional screening into the patient’s pre-operative assessment allowing early dietetic intervention for patients with malnutrition or patients that are at risk of developing malnutrition. All patients, regardless of nutritional status, are given oral nutritional supplements drinks by the enhanced recovery nurse, to be taken the day before surgery. Two hours prior to surgery, patients take Nutricia preOp® (manufactured by Nutricia Clinical Care) to provide 50g carbohydrate in an iso-osmolar solution. The formulation is designed to empty from the stomach within two hours. This carbohydrate loading means surgery is carried out with the patient in the fed state as opposed to the traditional fasted state.

Post operatively nutrition support in the form of additional high calorie snacks and oral nutritional supplement drinks are given to every patient on the ERP to help meet the increased nutritional needs post surgery. To increase compliance, advice is tailored to individual patient needs and preferences. Oral nutrition post-operatively is introduced early; patients are encouraged to take oral fluids while still in recovery. Dietary intake is commenced on the day of surgery as opposed to traditional care where patients were nil by mouth with naso-gastric tubes for drainage.

Patients, who have had a stoma formed, receive dietary counselling from stoma care nurses or the Dietician. Specific written dietary information is available for patients with colostomies and ileostomies.
Chemotherapy
Chemotherapy may be used before surgery (neoadjuvant), post surgery (adjuvant) or on its own as palliative treatment. Chemotherapy can sometimes be given in combination with Radiotherapy (Chemoradiotherapy). The main chemotherapy drugs used in colorectal cancer are Oxaliplatin, Irinotecan and 5-fluorouracil (5FU).

Side effects of chemotherapy which may contribute to weight loss and impaired nutritional status include; sore mouth and ulcers, taste changes, diarrhoea, lowered resistance to infection, nausea and vomiting, tiredness and anaemia. Research has demonstrated that patients presenting with weight loss before starting chemotherapy have an increased risk of developing treatment related toxicity compared to patients with no weight loss. As a consequence, these patients with weight loss may receive less chemotherapy, have decreased treatment response and a shorter overall survival (10).

Radiotherapy
Radiotherapy can cause nausea, anorexia, fatigue and emotional stress, all of which can contribute to reduced dietary intake. Radiation specifically to the pelvic area can cause acute inflammation in areas of the bowel which lie in the path of the radiotherapy beam, causing gastrointestinal symptoms including diarrhoea and abdominal pain. A large proportion of patients undergoing this treatment can lose weight (11). These symptoms can start during the second or third week of radical radiotherapy and may resolve after completion of treatment. Dietary counseling positively influences overall dietary intake, morbidity and quality of life in patients with colorectal cancer undergoing radiotherapy (12).

Chronic bowel damage (radiation enteropathy) is mainly due to loss of function because of fibrosis. The incidence of chronic bowel damage is difficult to assess, as patients may be lost to follow-up or may not report any changes to their clinician (11). Severe consequences of this include bowel obstruction, fistulation, intractable bleeding or secondary cancers. Less severe symptoms include urgency, frequency, faecal incontinence, diarrhoea, steatorrhoea, pain, constipation and weight loss and can impact on quality of life. Andreyev (13) recently reported on the causes and management of these symptoms. He outlined the potential role of pro and pre biotics, and dietary advice to avoid specific sugars that may be malabsorbed (e.g. lactose) in the management of loose stool-diarrhoea type symptoms. In addition, modification of fat in the diet may help alleviate steatorrhoea and adjusting fibre in the diet may help with subacute bowel obstruction. The potential benefits of these dietary modifications warrant well designed randomised studies to substantiate these benefits (11).

Alternative and Complementary Diets
It is understandable why patients with cancer are drawn to diets which claim to make a cancer shrink, increase chance of survival or cure the disease. However, alternative and complementary diets have not as yet been subjected to rigorous trials and therefore their benefits remain undetermined. Such diets often advocate the exclusion of whole foods groups, or promote high intake of bulky fibrous foods and low intake of fat and carbohydrate. These diets could potentially worsen nutritional status and hinder the efficacy of anticancer treatments. Patients may have many questions about alternative and complementary therapies. Rather then be discouraging, health professionals should talk through the perceived rational, evidence available, and pros and cons of the recommendations and enable them to make an informed decision. Where a patient chooses to follow an unconventional diet, support from a Dietitian could help minimise any detrimental impact on nutritional status.

Nutritional Screening
‘Nutritional Screening’ refers to a rapid, general, often initial evaluation undertaken by nurses, medical or other staff, to detect significant risk of malnutrition and need for referral to a Dietician for advice. A variety of screening tools to detect malnutrition exist, however none of these are specific to cancer. The European Society of Parenteral and Enteral Nutrition (ESPEN) have made recommendations on available tools (14). Nurses play a crucial role in facilitating screening of patients across the cancer care settings to ensure that patients get timely referral for nutritional assessment and dietetic support.

Role of the Dietician
National Institute for Clinical Excellence (NICE) published ‘Improving Outcomes in Colorectal Cancers Manual Update’ in 2004 (15). This document makes recommendations on aspects of services in England and Wales that are likely to have significant impact on health outcomes. It highlights the importance of nutrition throughout the treatment pathway and includes the Dietitian within the extended multidisciplinary team. The guidance makes particular reference to the need for dietetic support in the weeks after surgery for colorectal cancer. It also recommends patients with stomas should have access to specialist dietary support and advice.

The Dietician has an expert knowledge of nutritional assessment techniques, a sound understanding of the treatment pathways and associated nutritional problems of this patient group. The delivery of advice must be tailored to the patient’s disease, treatment plan and symptoms to ensure compliance. Close liaison with medical, nursing and pharmacy staff to ensure optimal symptom management is essential. Dietary advice and counselling are aimed at increasing both the frequency and the energy/nutrient density of foods and beverages. Dietary strategies to help alleviate symptoms are also provided. Artificial nutrition support by means of enteral tube feeding or parenteral nutrition may be recommended for some patients. Decisions about this type of nutrition support require a multidisciplinary approach. The aim of any advice and nutrition support provided is to maximise nutritional intake to preserve weight and nutritional status in order to optimise treatment outcomes.
Diet and Cancer

Is there a relationship?

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Research on diet and cancer is beginning to provide evidence that dietary patterns, foods, nutrients, and other dietary constituents are closely associated with the risk for several types of cancer. While a direct cause and effect relationship has not yet been proven, it is estimated that 35% of cancer deaths may be related to dietary factors. Results of recent research studies have shown that a diet low in fat and high in fiber, fruits, vegetables, and grain products is associated with a reduced risk for many types of cancer. Conclusive evidence of the benefit of any particular type of diet on cancer risk or recurrence is not yet available. There is, however, evidence that a well-balanced low-fat diet contributes to general health and well-being.

A high fat diet has been linked to an increased risk of breast, colon, prostate, and possibly pancreatic, ovarian and endometrial cancers. Higher incidences and mortality rates for breast, colon, and prostate cancers have been found in populations in countries with high fat diets compared to those with low-fat diets. However, because a high-fat diet is also highly correlated with calorie intake, it is unclear whether fat intake or calorie intake is the major dietary factor affecting cancer risk.

In contrast, evidence suggests that a diet high in fiber-containing foods is associated with a reduced risk for cancer, especially cancer of the colon. It is difficult to draw a conclusion that a high-fiber diet reduces cancer risk because foods high in fiber are those that are rich in fruits and vegetables and are therefore high in important nutrients and usually lower in fat.

Populations with a diet high in fruits and vegetables tend to have a lower cancer risk. Evidence has been found on the protective effect of fruits, vegetables, and grains on the risk of lung, colon and rectum, breast, oral cavity, esophageal, stomach, pancreatic, uterine cervix, and ovarian cancers.

Evidence exists that foods rich in carotenoids may reduce the risk of some cancers, particularly lung cancer. Most studies on the effect of carotene-rich foods (dark yellow/orange vegetables and fruits, deep green leafy vegetables) found that persons with higher levels had reduced risk of lung cancer.

Other vitamins and nutrients have been found to have a protective effect against cancer. There is consistent evidence which supports the protective role of vitamin C against cancers of the oesophagus, oral cavity, and stomach. Vitamin E has been linked to reduced risks of oral, stomach, and other cancers in epidemiologic studies. Evidence of the benefit of vitamin and mineral supplements on reducing cancer risk is, however, inconclusive.

Several recent studies have indicated that a relationship exists between dietary habits and the incidence and recurrence of some of the most common types of cancer. To date, data derived from large, randomized, controlled, longer term studies which provide conclusive evidence of a relationship between diet and cancer are lacking.

Diet may influence clinical outcomes in breast cancer

Women with breast cancer who eat a low-fat diet may have a lower risk of their cancer returning. Medical researchers recruited nearly 2,500 postmenopausal women who had been treated for early-stage breast cancer and randomized 975 to a low-fat diet consisting of 33 grams of fat per day (1). The remaining 1,462 women followed their normal diet and on average consumed 51 grams of daily fat.

After a median of 5 years of follow up, recurrence of breast cancer was found in 9.8% of women on the low-fat diet and 12.4%