



Cancer-associated malnutrition: An introduction

Maarten von Meyenfeldt*

Academic Hospital Maastricht, Maastricht, The Netherlands

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Summary Cancer is a major cause of morbidity and mortality throughout the world. It is the second most frequent cause of death in Europe and is becoming the leading cause of death in old age. Patients with cancer will develop a large number of physical symptoms. Malnutrition and weight loss are common and are due to a variety of mechanisms involving the tumour, the host response to the tumour, and anticancer therapies. Inadequate intake of energy and nutrients alone is unable to account for the substantial changes in nutritional status seen in patients with cancer. In advanced cancer, cachexia often occurs. This complex multifactorial syndrome is associated with metabolic abnormalities, anorexia, early satiety and reduced food intake, depletion of lean body mass, muscle weakness, oedema, fatigue, impaired immune function, and declines in attention span and concentration. The development and implementation of screening and assessment tools is essential for effective nutritional intervention and management of patients with cancer. Proactive nutritional interventions should ideally form an integral part of cancer therapy, with the aim of improving clinical outcomes and quality of life. This supplement brings together a collection of papers discussing various topics regarding nutrition in cancer.

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Zusammenfassung Krebsleiden stellen weltweit eine der Hauptursachen für Morbidität und Mortalität dar. Sie bilden in Europa die zweithäufigste Todesursache und sind mittlerweile zur Haupttodesursache bei älteren Menschen geworden. Patienten, die an Krebs leiden, entwickeln eine große Zahl von körperlichen Symptomen. Mangelernährung (Malnutrition) und Gewichtsverlust treten bei Krebspatienten häufig auf und werden durch diverse Mechanismen verursacht, an denen der Tumor selber, die Reaktion des Körpers auf den Tumor sowie die verabreichten Krebstherapien beteiligt sind. Eine unzureichende Zufuhr von Energie und Nährstoffen reicht als alleinige Erklärung für die massiven Veränderungen des Ernährungsstatus bei Krebspatienten nicht aus. In fortgeschrittenen Stadien des Krebsleidens tritt häufig eine Kachexie auf. Die Kachexie ist ein komplexes multifaktorielles Syndrom und mit Stoffwechselstörungen, Appetitlosigkeit, schnellem Sättigungsgefühl, reduzierter Nahrungsaufnahme, Verlust an fettfreier Körpermasse, Muskelschwäche, Ödemen, Fatigue, reduzierter Immunabwehr sowie

*Tel.: +31 43 387 7478/5487.

E-mail address: mf.vonmeyenfledt@ah.unimaas.nl.

Aufmerksamkeits- und Konzentrationsschwäche assoziiert. Die Entwicklung und Einführung von Screening- und Beurteilungs-Methoden ist für eine wirksame ernährungstherapeutische Behandlung bei Krebspatienten von entscheidender Bedeutung. Proaktive ernährungstherapeutische Interventionen bilden im Idealfall einen festen Bestandteil der Krebstherapie und haben zum Ziel, eine Besserung der klinischen Prognose und der Lebensqualität herbeizuführen. Dieses Supplement enthält eine Reihe von Artikeln, in denen diverse ernährungstherapeutische Themen in Zusammenhang mit Krebserkrankungen besprochen werden.

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Epidemiology of cancer

The term 'cancer' describes a wide range of malignant tumours, which may affect almost every organ and tissue of the body. It is essentially a consequence of genetic mutations within a cell, which result in the proliferation of abnormal cells.

Cancer represents a major global public health problem. Worldwide, it accounts for 7.1 million deaths annually (12.6% of the global total) (WHO, 2003); it is the second most frequent cause of death in Europe, and is becoming the leading cause of death in old age, with more than 70% of cancers occurring in those aged over 65 years (European Commission, 2001). Cancer will affect one in three in the population at some time in their life. In Europe each year there are 2.9 million new cases and 1.7 million deaths from the disease (Boyle and Ferlay, 2005). The prevalence of cancer will continue to increase as a result of the increasing elderly population (Quinn et al., 2003). Estimates predict that, by 2020, there will be 15 million new cancer cases every year (WHO, 2003).

In a recent survey of cancer incidence and mortality in Europe, lung cancer accounted for 13.2% of cases during 2004. Colorectal and breast cancer represented 13% and 12.8% of cases, respectively. Lung cancer was the largest cause of death (20% of all deaths), followed by colorectal (11.9%), stomach (8.1%) and breast cancer (7.6%) (Fig. 1) (Boyle and Ferlay, 2005).

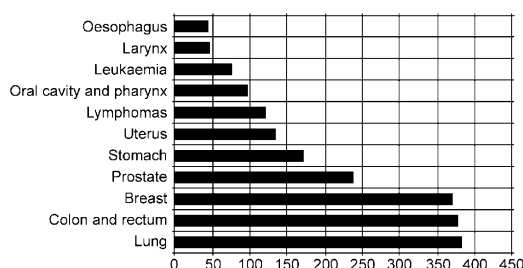


Figure 1 Estimated incidence of cancer in Europe, 2004 (number of cases, both sexes, in thousands) (Boyle and Ferlay, 2005).

In men, lung cancer was most common (19.4%), followed by prostate cancer (15.5%). In women, breast cancer was by far the most common form, with 27.4% new cases diagnosed each year (Boyle and Ferlay, 2005). Cancer presents a significant burden to society and the healthcare system; in human terms for patients and their families, and in terms of the resources consumed in the diagnosis, treatment and management of the disease (Redaelli et al., 2003).

Causes and consequences of cancer

In most patients, the cause of cancer is unknown. About 5% of all cases are thought to result from inherited genetic mutations, and 95% of cases are defined as 'sporadic', which means that they are the unpredictable consequence of a combination of genetic, environmental and chance factors. The main environmental factors implicated in cancer are cigarette tobacco, exposure to ultraviolet light, diet, alcohol, infectious agents, drugs, industrial pollutants and ionising radiation (Kumar and Clark, 1998; Thomas, 2001).

Patients with cancer may develop a wide range of physical symptoms. Cancer may produce non-specific systemic effects, such as anorexia, weight loss, malaise, fatigue or fever. Furthermore, different types of cancer give rise to different clinical features (e.g. dysphagia in patients with oesophageal cancer, and epigastric pain in those with gastric tumours). In addition, it is well known that anticancer therapies may produce significant side effects, such as altered perception of taste and smell, food aversions, nausea and vomiting, mucositis, bowel change, and early satiety (Greene et al., 1994; Taplin et al., 1997).

Nutritional status in cancer

Malnutrition is common in patients with cancer. Estimated prevalence rates vary according to

Table 1 The prevalence of malnutrition in different types of cancer (Stratton et al., 2003).

Tumour site	Prevalence of malnutrition as % of total patient cohort
Pancreas	80–85
Stomach	65–85
Head and neck	65–75
Oesophagus	60–80
Lung	45–60
Colon/rectum	30–60
Urological	10
Gynaecological	15

tumour site, disease stage and the type of treatment used and can range from 9% in urological cancer, to 46% in lung cancer, and up to 85% in pancreatic cancer (Table 1) (Stratton et al., 2003).

Weight loss is one of the factors that define malnutrition in patients with cancer and is a major cause of morbidity and mortality (Andreyev et al., 1998). Patients with pancreatic or gastric cancer appear to have the highest prevalence of weight loss; also, patients with head and neck, oesophageal or lung cancer often lose weight. During the course of the disease, weight loss greater than 10% of pre-illness body weight may occur in up to 45% of all affected patients (Stratton et al., 2003).

Malnutrition has been associated with a number of clinical consequences, including reduced quality of life, decreased response to treatment, increased risk of chemotherapy-induced toxicity and a reduction in survival (Dewys et al., 1980; Ovesen et al., 1993; Laviano and Meguid, 1996; Rey-Ferro et al., 1997; Andreyev et al., 1998). In addition, malnutrition affects normal functioning of organ systems, and even the organism as a whole. Thus, debilitating morbidities such as depression, fatigue and malaise may significantly impact on patient well-being.

Well-nourished people are best able to withstand medical treatment, which is particularly important in cancer. It has been suggested that weight loss reduces the ability of some patients to be treated as effectively with chemotherapy (Andreyev et al., 1998; Langer et al., 2001; Persson and Glimelius, 2002). In addition, nutrient deficits have specific adverse effects on immune competence, including decreased lymphocyte response to mitogens, impaired cell-mediated immunity, phagocytic dysfunction, impaired inflammatory response, and impaired cytotoxic T-cell activity (Langer et al., 2001).

Identification and treatment of malnutrition

Malnutrition can often be avoided by early detection and initiation of nutritional interventions (Ottery, 1995). Early identification through screening programmes helps to identify patients at risk, whereas nutritional assessment, which evaluates nutritional status, ensures appropriate treatment plans are put in place (Holder, 2003). Healthcare professionals must consider nutrition as a key element in cancer management strategies. Proactive rather than reactive nutritional interventions should form an integral part of cancer therapy in order to improve clinical outcomes and quality of life.

The aim of nutritional intervention should be to maintain or improve the patient's functional status. By minimising symptoms that affect food intake, and providing interventions to maintain or improve nutritional status, quality of life, response to treatment and survival will be maintained or improved (Ottery, 1995). However, there is a need for guidelines/protocols incorporating nutrition into the 'standard care' of patients with cancer. Nurses have an important role in helping to identify nutritional problems at an early stage and guiding patients in selecting an appropriate diet; additional interventions are discussed below.

Types of nutritional intervention

Dietary counselling has been shown to be effective in the management of nutritional problems in the early stages of nutritional decline (Ravasco et al., 2005). However, in patients who are unable to meet their nutritional needs despite dietary counselling, oral nutritional supplements can improve dietary intake (Ravasco et al., 2003). Oral supplementation is the simplest, most natural and least invasive method of increasing nutrient intake.

Enteral tube feeding is indicated in patients who are unable to meet their nutritional needs orally. In patients with cancer, enteral tube feeding has been shown to be preferable to parenteral feeding for several reasons, including a lower incidence of overall and infectious complications, and reduced length of hospital stay (Bozzetti et al., 2001; Elia et al., 2005).

This supplement brings together a collection of papers on the important subject of cancer-associated malnutrition. The aim of this supplement is to facilitate the understanding of cancer-associated malnutrition, including its causes and

consequences, and to demonstrate some of the approaches used to detect, treat and prevent this debilitating condition.

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