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Perspectives and Commentaries

Nutrition and Quality of Life in Cancer Patients

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(A COMMENT ON: Bruning, PF, Egger RJ, Gooskens, AC, *et al.* Dietary intake, nutritional status and well-being of cancer patients. A prospective study. *Eur J Cancer Clin Oncol* 1985, **21**, 1449–1459)

ANOREXIA-CACHEXIA is probably the most frequent paraneoplastic syndrome. The frequency and intensity of the syndrome vary however largely from one tumor to another; for example, weight loss before treatment is observed in 30–35% of favorable non-Hodgkin's lymphoma or breast cancer but in 90% of pancreas or gastric carcinomas [1]. On the other hand, biochemical tests are much more sensitive markers of nutritional status than weight loss and can thus detect subclinical undernutrition in almost all patients with advance cancer [2]. Many factors are involved in the progressive wasting of neoplastic disease. Various metabolic abnormalities, anorexia and treatment toxicity constitute the main causes and have been adequately reviewed elsewhere [3–5]. Inefficient glucose metabolism and increased lactate production, muscle catabolism combined to overall decreased protein synthesis, insulin hyposecretion and resistance, increased energy expenditure and other metabolic abnormalities have all been reported in cancer patients. However, it is difficult to determine what is primary from what is secondary to cancer anorexia, and doubts have even been raised about a specific cancer cachexia syndrome. Several theories have been to explain the lack of appetite, the altered taste and smell, and the early satiety that are characteristic of cancer anorexia [5]. One has postulated the release by neoplastic cells of oligopeptides or oligonucleotides acting on the hypothalamic center controlling food intake; other theories are based on increased levels of brain tryptophan and serotonin, or on the anorexigenic effect of elevated circulating concentrations of blood lactate, glucose or free fatty acids [4–6].

The toxicity of antineoplastic treatments is generally recognized as another major cause of cancer cachexia. Surgery, radiotherapy and chemotherapy have all specific adverse effects on the digestive tract or on the general metabolism. Learned food aversions are another possible consequence of chemotherapy that can be particularly deleterious when familiar foods consumed just before chemotherapy become the object of such aversions [7]. This leads us to the importance of psychological factors in the genesis or maintenance of cancer cachexia. If less than 10% of treated cancer patients fulfill the classical diagnostic criteria of depression, almost 50% have some psychiatric problems, "adjustment disorders" being the most frequent psychiatric diagnosis [8]. It seems, moreover that malnutrition is accompanied by a much higher incidence of psychologic and psychiatric disorders; "severe depression" has thus been reported in almost 60% of malnourished patients undergoing chemotherapy [9]. Anorexia is a classical symptom of severe depression and it is evident that mood and food intake are intimately related, feelings of malaise and distress coming from or leading to reduced food ingestion. Moreover, besides anorexia due to the neoplastic disease and its treatment, cancer patients frequently undergo episodes of transient anorexia linked to pain or emotional distress; this is particularly true at the time of initial diagnosis or recurrent disease [10].

The study of Bruning *et al.*, recently published in the Journal [11], goes somewhat against these concepts. The authors have prospectively evaluated the dietary intake and well-being of 108

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cancer patients during 20 weeks. Dietary intake before treatment corresponded to the "Dutch Recommended Dietary Allowances" and did not decrease much during antineoplastic therapy. Physical and mental well-being were evaluated by a complaint checklist, by the number of resting hours during day-time and by the widely used performance status scales. These parameters were generally adversely affected by antitumoral treatment, but the changes were rather small and normalized rapidly. Such studies have been too rarely performed and the detailed investigation of Bruning *et al.* has set up the basis for other similar prospective studies. However, their results and conclusions cannot be generalized and must strictly apply to the patient groups they have analyzed, namely well-nourished patients receiving adjuvant radiotherapy for uterus cancer, radical radiation treatment for localized bladder or prostate cancer, and patients with lymphoma treated by polychemotherapy with curative intent. These tumors are less frequently associated with weight loss and malnutrition than digestive or lung tumors for example [1], and it is likely that results would have been very different in malnourished or advanced cancer patients. More importantly, deleterious effects of antineoplastic treatment on dietary intake, nutritional status and quality of life are observed mainly in patients not responding or responding minimally to the antineoplastic treatment, whereas patients included in the trial of Bruning and collaborators received adjuvant treatment or had tumors of a relatively good prognosis. Chemotherapy *per se* does not necessarily lead to weight loss, as examplified by patients under adjuvant chemotherapy for breast cancer who frequently gain weight [12].

Cachexia and malnutrition can adversely affect survival, response rate to chemotherapy, subjective and objective tolerance to treatment, and quality of life [1–7]. It is however much less certain that forced nutritional rehabilitation is able to negate these adverse effects. Initial studies claimed that total parenteral nutrition decreased digestive and hematological toxicity of chemotherapy, increased response rate to treatment and possibly prolonged survival. Recent controlled prospective trials have, however, failed to confirm these conclusions [13, 14]. However, parenteral nutrition can maintain adequate nutritional status in aggressively-treated patients and in malnourished patients, can correspond loss of weight, hypoalbuminemia, creatininuria, and possibly improve muscle function, total body potassium and nitrogen. Although an actual increase in lean body mass remains controversial, parenteral nutrition is able to reduce the increased gluconeogenesis and muscle catabolism accompanying cancer cachexia. These improvements are however short-lasting, and it is not surprising that the benefits of short-term parenteral nutrition are negated by prolonged and repeated chemotherapeutic treatment [14]. If effects of parenteral nutrition on survival, response rate to chemotherapy, hematological toxicity and nutritional status have been extensively examined, the effects on the quality of life have been much less investigated. This is particularly important in the setting of palliative care where a primary goal of nutritional support, whether oral or parenteral, must be improvement of the quality of life. Initial studies claimed improvement of performance status and well-being of cachectic cancer patients. It is indeed not rare to observe, particularly with parenteral nutrition, reduction in anxiety and distress, improvement of mood, temporary optimism and better functional capacity, even in patients who are resistant to the antineoplastic treatment. However, this has not been prospectively investigated and must be balanced against the medical dependency, the increased costs and the inherent risks and discomfort of the technique. Judicious dietary advice and sometimes tube feeding are preferable for the vast majority of cancer patients treated palliatively.

Impact on nutritional status and quality of life of antineoplastic treatment with or without nutritional support should be properly and systematically investigated using objective measurements, but also by more subjective assessments such as the questionnaire developed by Bruning *et al.* [11] or other available quality of life indices [15]. It is not necessary to create new cooperative groups for such purposes, but simply to incorporate measurement of nutritional parameters and quality of life in chemotherapy trials. We would then obtain a better and more realistic assessment of what chemotherapy, with or without nutritional support, brings to the cancer patients, even if quality of life is more difficult to evaluate than tumor diameter.

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