Parenteral nutrition for symptom control in a patient with pancreatic cancer and generalized oedema – a case report

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The effect of parenteral nutrition (PN) in advanced cancer patients is exemplified at the clinical case of a male, 82-year old patient. Methods: Case report and short survey of the current literature. Results: In our patient with locally advanced pancreatic cancer, inflammatory state and recurrent ascites/oedema due to an anorexia-cachexia-syndrome, persistent symptom control could be reached by antiinflammatory treatment and supplemental PN until his death.

Keywords: Parenteral nutrition, cancer cachexia, symptom control, oedema, palliative care.

Introduction

The role of continuous parenteral nutrition (PN) in patients with incurable cancer is controversial. In cancer patients malnutrition was identified as a risk factor for a number of clinical problems within the last years [1], but recent guidelines do not generally recommend PN in patients with incurable malignancies without bowel obstruction [2], mostly due to a new understanding of the complex mechanisms of cachexia that are weakly related with anorexia and decreased nutritional intake [3].

Proinflammatory cytokines cause an ongoing loss of skeletal muscle mass, which is not fully reversible by conventional nutritional support leading to progressive functional impairment and involuntary weight loss. Recently, a definition and classification of cachexia in cancer patients was published, mainly focusing on three domains: percentage of weight loss, body mass index and sarcopenia. Furthermore, various stages (precachexia to cachexia to refractory cachexia) were described [4].

Therapeutic approaches for the treatment of the cancer-related anorexia-cachexia syndrome are anti-inflamma-

tory treatment and anti-cancer treatment (due to the fact that the tumour itself can act as a “catabolic driver”). Other effective medical treatments seem to be progestagens, corticosteroids, omega-3 fatty acids and cannabinoids, next to other substances with a lower level of evidence [5]. Basic conditions for a regular food intake should be kept in mind, secondary types of the anorexia-cachexia syndrome as impaired oral intake, impaired gastrointestinal absorption or infections with an additional catabolic state attended [6]. Additionally, nutritional recommendations for the management of sarcopenia have been published, highlighting the role of exercise in combination with adequate protein and energy intake [7].

Clinical case

In our patient (male, 82 yrs.) locally advanced pancreatic cancer (adenocarcinoma, histological grading II) was diagnosed after the patient had observed a painless ikterus. Following endoscopic retrograde cholangiopancreatography (ERCP), papillotomy and plastic-stent implantation, three cycles of gemcitabine and oxaliplatin were administered. After ERCP hepatic abscesses were observed, resulting in longer-lasting stops between the single chemotherapeutic cycles due to recurrent episodes of fever. Three months after diagnosis increasing cholestasis led to another ERCP with subsequent wall stent implantation. One month later computerized tomography showed increasing hepatic abscesses. *Streptococcus mitis* and *Hafnia alvei* were diagnosed in microbiological analysis, and antibiotic treatment with amoxicillin and clavulanic acid was started. An ascites puncture, performed one day before admission at our department, revealed 9,000 ml of ascites. Peritoneal carcinosis has never been shown in computerized tomography.

At the time of admission at our palliative care department 5 months after diagnosis, the patient presented generalized oedema, ascites, weakness and anorexia. Karnofsky index was 30%, weight 70 kilograms (kg) and body mass index (BMI) 23.4. A weight loss of 8 kg (11%) within 6 months was reported by the patient. Laboratory parameters showed increased inflammation parameters and decreased prealbu-

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Tab. 1: Course of laboratory parameters during hospital stay

Time (day of hospital stay)	1	13	18
Leukocytes (G./l)	11.5	7.81	5.99
C-reactive protein (mg/l)	93.6	15.6	9.0
Prealbumin (mg/l)	50	100	n.a.
Albumin (g/l)	27	35	n.a.
Total protein (g/l)	64	74	n.a.
Cholinesterase (U/l)	921	n.a.	n.a.
n.a. not assessed.			

min, albumin and cholinesterase (Table 1). When abdominal sonography was performed, it showed the abscess cavity filled with air and only a small amount of fluid. Therefore, drainage of the abscess was not indicated. After port-a-cath implantation, parenteral antibiotic treatment and PN with a three-chamber bag were started (830 kilo-calories (kcal) day 1–5; 1100 kcal from day 6). Furthermore, the patient received oral enteral nutrition supplements (200 kcal per day) in addition to his regular meals. Human albumin (20%, 100 millilitres (ml)) was added for 2 weeks, and spironolactone (100 milligrams (mg) day 1–6; 50 mg from day 7) was administered. On the 6th day during the patient's stay, a new ascites puncture was performed and 7,000 ml was drained.

It was evident that the patient had problems to retain facts in short-term memory. After a mini mental state examination, indicating 21 points, anti-dementia treatment was started. The patient began physical examinations instructed by a physiotherapist.

All these measures led to an improvement in the above-mentioned laboratory parameters, a weight loss of 14 kg due to reduced oedema and increased mobility. There was no need for another ascites puncture. The patient was discharged after 19 days with a weight of 56 kg (BMI 18.7), decreased inflammatory parameters, a slightly increased prealbumin and albumin (Table 1) and a Karnofsky index of 60%, and stayed at home with parenteral nutrition and continuous orally admitted antibiotic treatment until his death 4 months later. No episodes of fever, oedema or ascites occurred after discharge. Continuous antibiotic treatment and PN combined with physiotherapy resulted in an adequate persisting symptom control in our patient.

Discussion

The reason for starting and maintaining PN in our patient was to guarantee a high calorie supply next to oral nutrition supplements to treat hypoalbuminemia (caused by malnutrition next to inflammation), which seems to have played an essential role in our patient's symptomatology. Malnutrition and subsequent protein deficiency were probably hindered by dementia (a secondary cause for cachexia?), causing irregular eating habits. Additionally, in the absence of peritoneal carcinosis, the genesis of ascites and generalized oedema might be caused due to the inflammatory state and a subsequent, reversible capillary leak syndrome due to hepatic abscesses, leading to continuous antibiotic treatment.

Weight measurement was problematic due to generalized oedema; presumably the initially measured BMI was incorrectly high. Considering this problem, all criteria for cachexia (weight loss greater than 5%, BMI lower than 20, sarcopenia, reduced food intake and systemic inflammation) were found in our patient.

A recently published study found out that home PN is used in about 11% of cancer patients enrolled in palliative home care services, and contrary to the existing guidelines, it is also used to supplement oral intake even in the absence of a non-functioning gastrointestinal tract [8]. PN was shown to improve mean body mass index (BMI), quality of life and survival in patients with advanced cancer and PN combined with oral enteral nutrition supplement compared to patients with oral nutrition supplement alone [8]. Similar findings were presented in recently published studies investigating the role of additional PN in patients with advanced pancreatic cancer [9]. Further study results on PN in pancreatic cancer patients are outstanding [10].

Recently it was shown that improvement in physical activity might be a variable to measure treatment effects of anti-cachexia therapy in cancer patients [11]. Our efforts resulted in an increased patient's mobility and an inclined Karnofsky index, probably caused by the improved nutritional state, and could be an advice for a slowed sarcopenia.

In the light of new findings on pathophysiological changes in cachectic cancer patients on the one hand and the large amount of PN products on the other hand, further studies focusing on the use of PN in this very special patient group are necessary. Recently a study investigating indications, goals/outcomes and practices of PN in patients with malignant bowel obstruction was presented on the 6th "Cachexia Conference" in Milano 2011 [12]. Studies like this might be helpful for the development of new guidelines supporting the decision making on the use of PN in patients with advanced cancer.

Conflict of interest

The authors declare that there is no conflict of interest.

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