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Review article

Nutritional management of older adults with gastrointestinal cancers: An International Society of Geriatric Oncology (SIOG) review paper

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ABSTRACT

Malnutrition is one of the most common physical manifestations of gastrointestinal (GI) cancers and is often under-diagnosed and under-treated. Like cancers, malnutrition occurs more commonly in older adults, with potential negative consequences to quality of life, functional status, tolerance to treatment, and prognosis. Nutritional assessment and management require a proactive and systematic, multi-disciplinary approach. Early assessment, detection, and prompt intervention of cancer–associated malnutrition and cachexia are equally essential to achieve better quality nutritional care for older oncology patients. This article aims to provide an overview of the evidence associated with poor nutrition and outcomes in older adults with GI cancers, and recommends a management approach from a geriatric oncologist's perspective.

Contents

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1. Overview of the Evidence Associated With Poor Nutrition and Outcomes in Older Patients With Gastrointestinal Cancers

Almost 30% of cancer incidence and 32% of cancer deaths worldwide are due to gastrointestinal (GI) malignancies, [1] and both incidence and mortality rise exponentially with age. The aging process is associated with sarcopenia, comorbidities with associated loss of functional reserve of multiple organ systems, and increased vulnerability to frailty [2]. Poor nutritional status is a known poor prognostic factor in patients with malignancies [3,4], causing a significant concern as the risk of cancer and malnutrition are more common in an older population [5]. In general, approximately 10–20% of cancer deaths can be attributed to malnutrition rather than the cancer itself [4,6,7]. The French National Authority for Health defined malnutrition in older adults as one or more of the following: ≥5% weight loss in 1 month or ≥10% in 6 months, and/or Mini-Nutritional Assessment (MNA) score of <17/30, and/or serum albumin <35 g/L, and/or body mass index (BMI) of <21 kg/m^2 [8]. However, a BMI ≥21 does not exclude the diagnosis of malnutrition, such as in the case of sarcopenic obesity [9]. Age >70 years and malnutrition increase the risk of death 2–2.5 times, respectively [4]. However, in older patients, it is often more difficult to delineate age-related versus tumor–related effects on malnutrition. In addition to underrepresentation in clinical trials and lack of management consensus guidelines, very few oncologic papers distinguish young from older adults and the age cut-off values often vary, making their management rather challenging. This article reviews the current evidence supporting the negative impact of poor nutrition on the management outcomes of patients including older adults, with a specific focus on GI cancers. We systematically identified studies published in English over the last decade on the nutritional status of older adults with GI cancers through PubMed and MEDLINE databases, by combining search terms "malnutrition", "sarcopenia", "screening", "GI cancer", and "elderly". Additional articles were identified from citations in the articles that were evaluated. As the terminology relating to malnutrition varies, specific terms and definitions used in this manuscript are defined in Table 1.

1.1. Sarcopenia

The aging process is associated with sarcopenia, a gradual and progressive loss of skeletal muscle mass leading to reduced strength or physical performance [10] that is commonly seen in sedentary older adults. Sarcopenia has an estimated prevalence of 30% among adults >60 years [11] and a decline in muscle mass is expected at a rate of up to 15% per decade at ≥70 years of age [12]. It accelerates the risk for developing adverse outcomes such as functional impairment and disability [13,14], poor quality of life (QoL) and death [10], and its effect could be magnified in the presence of malignancy. Regular aerobic and resistance exercises, along with adequate protein and energy intake have been shown to help counteract the effects of age-related decline in muscle mass, strength, and function in healthy older adults [15]. Specific to cancers, sarcopenia has often led to worse outcomes, including increased risk for developing 5-FU and capecitabine-related ≥ grade 2 toxicities [16,17], the mainstay of treatment for most GI cancers, and a 2-fold increased mortality for patients with colorectal cancer (CRC) with >5% muscle loss post-chemotherapy [18]. Table 2 summarises the negative consequences of sarcopenia in GI cancers.

1.2. Cachexia

Cachexia is provisionally defined as ≥5% involuntary weight loss over 6 months; or BMI <20 and any degree of weight loss ≥ 2%; or sarcopenia and any degree of weight loss >2% [19]. Although, such a definition has gained some popularity among clinicians, it does not account for the different BMI thresholds between younger and older adults [20–22]. Moreover, refractory cachexia, a syndrome commonly defined as irreversible and unresponsive to nutritional interventions [3], may not always be accurate, as the provision of nutritional support becomes more sophisticated and specific. For instance, it is now possible to integrate nutritional supplements with anabolic or anti-catabolic agents [23], to better treat the cachectic status compared to using standard nutritional support.

Cachexia is commonly associated with inadequate nutrient intake leading to a general state of deterioration and deconditioning, decreased or absent physical activity, and altered metabolism due to a pathological systemic inflammatory response [24]. This condition can occur even in the absence of apparent weight loss, or prior to losing fat mass, and can be exacerbated by cancer therapy [25]. It may also be obscured by obesity, resulting in under-diagnosis and excess mortality [25]. The cancer itself and its related treatments often cause taste and smell alterations, appetite loss, swallowing and absorption disorders, and enhanced catabolism [19], leading to higher nutritional risk. In the absence of appropriate intervention, loss of substantial muscle mass is almost inevitable and will eventually lead to progressive cachexia. Management is therefore multidimensional, and involves early initiation of nutritional care or support, resistance exercises to prevent muscle atrophy, endurance exercises to counteract fatigue, and treatment of inflammation-related hypermetabolic state [19] where possible.

1.3. Gastrointestinal Cancers

Nutritional risk, although common in older adults with cancer, is notably higher in patients with GI malignancies, particularly in the presence of GI symptoms [26] such as, anorexia, early satiety, nausea, vomiting, dysphagia, odynophagia, diarrhea, constipation, malabsorption, and pain. In some patients, unintentional weight loss, mostly from GI symptoms, is present long before the diagnosis of malignancy is made. Weight loss at presentation has been associated with reduced ability to tolerate anti-cancer therapy, increased severe dose-limiting toxicities, lesser response rates, worse QoL, decline in performance status, and shorter survival outcomes among patients with locally advanced or metastatic GI cancers [27]. The prevalence varies depending on the definition used in the literature and the GI cancer type – 28–54% in hepatocellular, 39–71% in colorectal, and 56% in pancreatic cancers [28].

Table 1
Terminology.
(Adapted from [3,19].)

	Etiology	Intervention
Anorexia	Limited food intake from altered CNS appetite signals related to disease or its treatment, or from structural or functional limitations to food intake (i.e. mucositis, obstruction, altered intestinal transit, etc.)	Pharmacologic agents
Starvation	Loss of body fat & non-fat mass caused by poor protein-energy or nutrient intake	Adequate nutritional support
Sarcopenia	Reduction or loss of skeletal muscle mass and strength with aging, which may lead to functional impairment	Physical exercise High protein and energy diet
Cancer cachexia	Involuntary multifactorial wasting of protein or energy stores and skeletal muscle mass, with or without loss of fat mass.	Physical exercise High protein and energy diet
	Release of pro-inflammatory cytokines results in significant weight loss, altered body composition, and decline in physical function	Anti-inflammatory agents Anti-cancer treatment

CNS = central nervous system.

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