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Nutrition and
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The Burden of Malnutrition

- Malnutrition (Undernutrition) Screening Tools for All Adults
- Determinants of Malnutrition in Older Adults
- Malnutrition in Inflammatory Bowel Diseases

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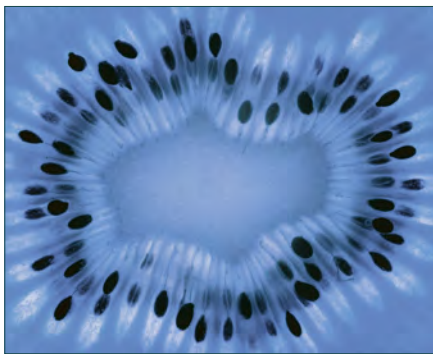
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Close up of a slice of kiwi fruit

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Elke Naumann

European Federation of the Associations of Dietitians (EFAD), Naarden, The Netherlands

Malnutrition

As the editor in chief, I welcome you to the second issue of Kompass Nutrition & Dietetics. I hope you enjoyed the first one!

On behalf of EFAD, I would like to thank Liana Poulia who was the editor of the first issue and also largely involved in the preparation of this second issue. Thank you, Liana, for your contributions to make the launch of Kompass Nutrition & Dietetics possible!

For future editions, we will work with an expert board to decide on upcoming topics. More information about the process and submitting procedures can be found on the EFAD website (www.efad.org/en-us/kompass-nutrition-dietetics/information-guidelines).

The topic of the current issue is malnutrition, which is a major problem around the world. Up until 2018, there was no consensus on the definition of malnutrition. In 2018, a consensus report from the global nutrition community was published. The Global Leadership Initiative on Malnutrition (GLIM) developed a consensus scheme for diagnosing protein-energy malnutrition in adults in clinical settings on a global scale [1]. According to GLIM criteria, diagnosing malnutrition starts with screening the patient using a validated screening tool. This is followed by a diagnostic assessment which provides information on phenotypic (non-volitional weight loss, low body mass index, reduced muscle mass) and etiologic (re-

duced food intake or assimilation, disease burden/inflammation) characteristics. If at least one phenotypic and etiological characteristic is present, the criteria for malnutrition are met. The severity of malnutrition can then be determined based on phenotypic criteria.

Several nutrition screening tools exist for both patients in various healthcare settings and community-dwelling patients. A good screening system is important for the early detection and treatment of malnutrition. In addition, prevention of malnutrition may be even more important. Besides knowledge and expertise from (healthcare) professionals, prevention requires awareness about malnutrition, i.e. the multiple risk factors for onset of malnutrition, among (healthcare) professionals, informal caregivers, and citizens.

Ultimately, malnutrition is caused by low food intake, reduced nutrient availability, or increased nutrient requirements; however, the reasons for these underlying causes are diverse: Inflammatory diseases may increase nutrient requirements; mobility limitations may cause difficulties with grocery shopping or meal preparation leading to decreased food intake; oral pain or chewing problems may hinder food intake; cognitive impairment, loss of interest in life, and many other conditions may further contribute to the development of malnutrition.

The DOMAP model clearly indicates all po-

tential determinants of malnutrition [2]. To prevent or treat malnutrition, it is necessary to detect why someone is – or may become – malnourished and thus establish a suitable treatment plan. After all, simply telling a person to eat more when, for example, the reason for the decreased food intake is oral pain, will not result in successful treatment. It requires collaboration between healthcare professionals, social workers, informal caregivers, and patients/citizens to prevent, screen for, diagnose, and treat malnutrition. This issue features knowledge transfer articles written by experts from various EFAD European Specialist Dietetic Networks which aim to bridge the gap between science and clinical practice.

Enjoy reading!

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Position of the Academy of Nutrition and Dietetics: Malnutrition (Undernutrition) Screening Tools for All Adults

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Abstract

It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the Malnutrition Screening Tool should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting. Malnutrition (undernutrition) screening is a simple process intended to quickly recognize individuals who may have a malnutrition diagnosis. While numerous malnutrition screening tools are in use, their levels of validity, agreement, reliability, and generalizability vary. The Academy of Nutrition and Dietetics reviewed the body of evidence sup-

porting malnutrition screening tools and determined a single tool for identifying adults in all settings who may have malnutrition, regardless of their age or medical history. The Nutrition Screening for Adults Workgroup conducted a systematic review of the most robust evidence to promote using the highest-quality malnutrition screening tool available.

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Position Statement

It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the Malnutrition Screening Tool should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting.

Malnutrition (undernutrition) among adults aged 19 years through old age is a common nutrition problem [1]. Because not all individuals with malnutrition have direct access to registered dietitian nutritionists (RDNs), screening to identify those who may have malnutrition or be at risk for malnutrition is a routine part of the intake or admission process in community and health

care settings. Nutrition screening, as described in the Nutrition Care Process, is separate and distinct from nutrition assessment [2, 3], and is performed by nurses; medical assistants; and nutrition and dietetics technicians, registered. Based on a predetermined score, patients or clients are referred to an RDN for nutrition assessment, an in-depth process that is a licensed function in many states. Nutrition assessment may involve verifying some of the information obtained during screening and then obtaining additional information necessary for a malnutrition diagnosis [3]. Widespread use of valid and reliable malnutrition screening tools increases the likelihood that individuals referred to an RDN for assessment will have a malnutrition diagnosis. Conversely, using valid and reliable tools avoids unnecessary referrals of people who do not have malnutrition.

Position Focus

Malnutrition occurs in health care settings, and in communities where people suffer from food insecurity and hunger. Thus, this position applies in all settings where food assistance and nutrition services are available. This position is based on a comprehensive systematic review [4, 5] and is intended to provide RDNs and all other health professionals with validity, agreement, reliability, and generalizability data for six malnutrition screening tools supported by the largest number of studies (Malnutrition Screening Tool [MST] [6], Malnutrition Universal Screening Tool [7], Mini Nutritional Assessment–Short Form [8, 9], Short Nutritional Assessment Questionnaire [10], Mini Nutritional Assessment–Short Form Body Mass Index [11], and Nutrition Risk Screening 2002) [12]. This position supports using a single tool to identify adults who may be malnourished regardless of age, acute and chronic medical conditions, or settings where care is received.

Position Statement Development Process

The Academy's Nutrition Screening for Adults Workgroup systematically reviewed validation studies for malnutrition screening tools published in the peer-reviewed literature from January 1997 through July 2017 and used the results as a basis for this po-

sition [4, 5]. The Workgroup included tools that met the Academy's 2011 definition of nutrition screening (Table 1), which was created for an earlier version of this project [13]. As in the earlier systematic review, the Workgroup sought quick and easy screening tools, defined as requiring fewer than 10 minutes to complete. For the current position, the requirement for robust data necessitated inclusion of tools with adequate supporting evidence, defined as greater than four validation studies. The Workgroup considered the overall validity, agreement, and reliability results and grades of supporting evidence for each tool, then generalizability of each tool to the widest variety of medical diagnoses or age groups and settings and ranked the tools accordingly (Table 2). The position paper was posted for public comment before publication.

Position

It is the position of the Academy of Nutrition and Dietetics that, based upon current evidence, the MST should be used to screen adults for malnutrition (undernutrition) regardless of their age, medical history, or setting.

Ferguson and colleagues [6] developed the MST to detect malnutrition or risk for malnutrition. Between 1999 and 2017, the MST was validated in acute, long-term, rehabilitation, and ambulatory

Table 1. The Academy of Nutrition and Dietetics' definition and key considerations for nutrition screening

Definition: Nutrition screening is the process of identifying patients, clients, or groups who may have a nutrition diagnosis and benefit from nutrition assessment and intervention by a registered dietitian nutritionist (RDN).

Key considerations:

- May be conducted in any practice setting as appropriate
- Tools should be quick, easy to use, valid, and reliable for the patient population or setting
- Tools and parameters are established by RDNs, but the screening process may be carried out by nutrition and dietetics technician, registered and other trained personnel
- Nutrition screening and rescreening should occur within an appropriate time frame for the setting.

(Reprinted with permission from Skipper and colleagues [13]; © 2012 American Society for Parenteral and Enteral Nutrition.)

Table 2. Validity, agreement, reliability, generalizability, and strength of evidence of adult malnutrition (undernutrition) screening tools

Tool	Validity ^a					Agreement ^a	Reliability ^a	Generalizability ^c	Evidence Grade, Strength ^d
	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Overall Validity ^b				
MST ^e	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Good	I, <i>Good/strong</i>
MUST ^f	Moderate	Moderate	Moderate	High	High	Moderate	Moderate	Fair	II, <i>Fair</i>
MNA-SF ^g	Moderate	Moderate	Low	Moderate	Moderate	Low	Moderate	Fair	II, <i>Fair</i>
SNAQ ^h	Moderate	High	Low	High	Moderate	–	Moderate	Fair	II, <i>Fair</i>
MNA-SF-BMI ⁱ	Moderate	Moderate	Moderate	High	High	Moderate	–	Limited	II, <i>Fair</i>
NRS-2002 ^j	Moderate	High	Moderate	Moderate	Moderate	Moderate	–	Limited	II, <i>Fair</i>

^a Sensitivity, specificity, positive predictive value, negative predictive value cutoffs: High: 90% to 100%, moderate: 80% to ≤89%, low: ≤79%; agreement and reliability κ. Cutoffs: High: 0.8 to 1; moderate: 0.6 to ≤0.79; low: ≤0.59. ^b See Figure 3 in Skipper and colleagues [4] for the algorithm to determine the overall validity. ^c The Workgroup determined generalizability based on usefulness of each tool across the broadest array of adult age groups, locations, diseases, and treatments according to evidence. ^d Elements considered in the evidence grade include quality of the evidence, consistency of results across studies, quantity of studies, and number of subjects, clinical impact of outcomes, and generalizability to population of interest [14]. ^e MST = Malnutrition Screening Tool. ^f MUST = Malnutrition Universal Screening Tool. ^g MNA-SF = Mini Nutritional Assessment–Short Form. ^h SNAQ = Short Nutritional Assessment Questionnaire. ⁱ MNA-SF-BMI = Mini Nutritional Assessment–Short Form Body Mass Index. ^j NRS-2002 = Nutrition Risk Screening 2002.

care and oncology clinics in at least nine different countries [15–33]. These studies revealed that the MST exhibited a moderate degree of validity, a moderate degree of agreement, and a moderate degree of inter-rater reliability in identifying malnutrition risk in adults (Table 2). The strength of evidence for the MST is Grade I, *good/strong* with good generalizability [4, 5, 14]. Some of the other tools also had high or moderate validity, agreement, or reliability, but were not supported by Grade I evidence or good generalizability [4, 5].

Implication for Practitioners

While disease-, age-, or setting-specific malnutrition screening tools exist, most organizations where malnutrition screening occurs have clients or patients of different ages with one or more medical problems and provide nutrition care in a variety of settings. The value of using different screening tools for individuals with different personal characteristics is unclear, and subject to practical limitations. It is appropriate to implement the screening tool that will most accurately identify adults who may have malnutrition. Institutions and programs that implement the MST should have data available to consistently compare the populations screened for malnutrition, predict the resources for needed treatment, and support research.

Based upon the best available evidence [4, 5], the Academy advocates that RDNs:

- Assume a strong leadership role in implementing the MST. A benefit to society occurs if individuals who may have malnutrition obtain nutrition assessment and intervention services from an RDN. This benefit is not without cost because of the time required for an RDN to complete a nutrition assessment. Thus, the impact of changes to screening procedures affects the amount of RDN time available to provide other required nutrition services and provides justification for RDNs to select and oversee implementation of malnutrition screening tools.
- Implement the MST without changes to the wording of the questions or the scoring system for referrals as originally presented [6]. Adding items, modifying questions, or interpreting scores differently than intended by the authors of the tool should be avoided, as these changes invalidate the MST. Individual patients or clients with an MST score of ≥ 2 should achieve the greatest benefit from an RDN referral.
- Provide ongoing training to paraprofessionals who administer the MST and monitor the impact of the screening and referral process by summarizing data from individuals with malnutrition.
- Abandon all unvalidated malnutrition screening tools (eg, pressure injury and illness severity tools), including tools that were validated, then modified without rigorous re-validation against a standard definition of malnutrition.

- Discourage strongly the development of new screening tools in favor of further validating existing tools [13], especially in adults between the ages of 19 and 49 years, over age 90 years, and in community and long-term care settings.
- Research the costs and outcomes of the malnutrition screening procedure. Minimal data exist on the financial implications of the proper identification of patients who do or do not have malnutrition or the costs of the screening procedure [4, 5]. Obtaining these data could enable the projection of malnutrition assessment and intervention cost and should be a research priority.
- Research the minimum level of education and training needed to accurately administer the MST and develop education and training materials to facilitate consistency among users.
- Develop partnerships with patient advocacy groups, other health care professional organizations, and policy makers to implement the MST.

Conclusions

The amount and quality of evidence for validated malnutrition screening tools has grown considerably since an earlier review of the topic. This additional evidence supports using a single tool, the MST, to screen all adults for malnutrition (undernutrition) in all settings where malnutrition screening occurs. Replacing other malnutrition screening tools, especially those not rigorously validated, with the MST is expected to identify persons with malnutrition and provide consistent data to support nutrition practice and policy.

Statement of Potential Conflict of Interest

The authors of the paper have no conflicts to disclose. A. Skipper is an employee of the American Medical Association (AMA), but the ideas expressed in this position are those of the Academy of Nutrition and Dietetics and do not reflect AMA policy.

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Food Insecurity and Malnutrition

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Abstract from Christian VJ, MillerKR, Martindale RG: Food Insecurity, Malnutrition, and the Microbiome. *Curr Nutr Rep.* 2020;DOI: 10.1007/s13668-020-00342-0.

Keywords

Food insecurity · Food desert · Hunger · Malnutrition · Microbiome · Microbial immaturity · Dysbiosis, Probiotic

Abstract

Purpose of Review: Food insecurity is defined as the disruption of food intake or eating patterns because of lack of money and other resources. Although a relationship between food insecurity and malnutrition would seem intuitive, this relationship remains unclear. This review was aimed at summarizing the emerging evidence of the relationship between food insecurity, malnutrition, and intestinal microbial changes.

Recent Findings: Evidence suggests that malnutrition is certainly associated with alteration in the intestinal microbiome. Alternative theories have been proposed as to the nature of the alteration, whether that be a result of microbial immaturity, dysbiosis, or contributions from both processes.

Summary: Although the evidence continues to evolve, targeted nutritional therapies in conjunction with specific microbial therapy of probiotics or prebiotics may hold great promise for the treatment of malnutrition in the clinical and community settings.

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Knowledge Transfer

Background

'without nutritious food, there is sub-optimal health'

Food insecurity occurs when people are regularly worried or concerned about their ability to access adequate amounts of safe, affordable, and nutritious foods [1]. It is a global problem and can occur because of a lack of income to afford healthier foods or because healthier food choices are not easily available. The latter can occur for a number of reasons. For example, anything that affects the food supply chain may affect access to healthier foods. Or a person's circumstances may mean that it is harder for them to access healthier foods, and these circumstances can be multifactorial – perhaps because they have limited transport or limited storage/cooking facilities. Some people are able to adapt to circumstances to maintain a reasonably nutritious diet, whilst others are more susceptible to relative changes in their levels of food insecurity [2]. Food insecurity, whether a relative change or absolute severity, may increase the risk of malnutrition in all of its forms [1, 3]. Certain groups of the population are more vulnerable to food insecurity and thus more susceptible to dietary inadequacies. Of concern is that these vulnerable groups include pregnant mothers, families with children, the elderly, and people on a low income or dependent on state benefits who already experience wider health inequalities.

Effects of the COVID-19 Pandemic on Food Insecurity

The COVID-19 pandemic has led to economic and social crises, and the prevalence of global food insecurity has increased [4]. We have become more aware of food insecurity, whilst in the past it has been a hidden cause of malnutrition. Unemployment, under-employment, and employment uncertainty are the reality for many people due to the pandemic. COVID-19-related global lockdowns affected all stages of the food supply chain from farm to fork, including processing and production, distribution, and consumption [5]. The United Nations World Food Program estimated that 265 million people, a two-fold increase, faced acute food insecurity by the end of 2020 [6]. Two USA surveys have found that the COVID-19 pandemic has led to far higher rates of food insecurity in households with children than in previous years [7]. The first reported that 34.4% of households with children ≤ 12 years old were food insecure by the end of April 2020, compared with 15.1% in 2018. The Survey of Mothers with Young Children reported similar household food insecurity among 40.9% of mothers with children ≤ 12 years old, with 17.4% claiming that "the children in my household were not eating enough because we just couldn't afford enough food", compared with 3.1% in 2018. The elderly living alone, managing on limited incomes, have become more isolated and socially detached during the lockdown periods and have struggled more to access their normal support. The causes of food insecurity and under-nutrition amongst older people are multiple, and increased isolation may have further negatively impacted general physical and mental

health, appetite, food availability and supply, as well as family, social and care support [8].

Forms and Consequences of Food Insecurity

Food insecurity does not just affect the amount of food which is eaten but also influences food choice. Food insecurity is generally considered to be linked to the preference of processed foods over foods of high nutritional value such as vegetables and fruits due to a 'substitution' effect where higher-quality and/or less calorie-dense foods are replaced with more perceived filling energy-dense foods, often high in simple carbohydrates and fat, that are cheaper on a per-calorie basis [9]. Cross-sectional studies support this hypothesis in both children and adults. In a study of 3,605 children aged 9–11, Fram et al. found that child food insecurity was associated with a lower Healthy Eating Index (HEI) vegetable subscale score and a higher intake of energy, fat, and sugar [10]. Child food insecurity was not associated with fruit intake or total HEI score in this study, with other studies suggesting that reduced fruit may be compensated by an increased fruit juice intake [11]. In a sample of just over 2,000 children aged 13–17 in Ethiopia, Belachew et al. reported that food insecurity was associated with a lower intake of animal-based food, protein-rich food, dairy products, and fruit. Food insecurity was also associated with lower diet diversity and food variety scores [12]. Food insecurity was found to be associated with a lower total HEI score and a higher intake of added sugars and empty calories in adults participating in the 2003–2010 National Health and Nutrition Examination Surveys (NHANES) [13]. In a comprehensive review of the literature, food insecure adults consumed fewer fruit, vegetables, and dairy products [14]. The 2016 National Nutrition Screening Survey suggests that around 1.3 m people aged 65 years and older in the UK do not get sufficient energy and protein in their diets [15].

Maternal food insecurity during pregnancy may cause lower-than-recommended weight gain and is associated with intrauterine growth restriction [1]. For children and adolescents, exposure to food insecurity may be associated with impaired growth and physical development, cognitive deficits and reduced educational attainment, chronic physical and mental health problems, and increased mortality [16]. Food insecurity has cognitive and behavioural implications for parents and caregivers, including skipping meals due to limited income, hoarding food, and pressuring or overfeeding children when food is available because of worry about running out of food. It can negatively impact overall child well-being through the associated family conflict. Stress, bouts of starvation, secretive eating, and food cravings during times of financial hardship may promote binge-eating episodes in both children and adults [17]. Food insecurity is positively associated with levels of obesity in females perhaps due to a combination of changes in food choice and changes in eating behaviours [18]. In contrast, the associated under-nutrition is a major cause of functional decline and mortality amongst older people. It can lead to poorer health

outcomes, falls and fractures, delays in recovery from illness, and longer periods in hospital [8].

Of increasing interest is the impact that food insecurity can have on the gut microbiota, and it has been reported that gut microbiota composition and function are altered in nutritionally depleted states [19]. A healthy gut microbiome is dependent on a healthy and diverse diet for all ages. We know that a diversity in fibre intake from minimally processed foods is beneficial. In contrast, a diet high in refined carbohydrate and low in vegetables and whole fruits may lead to dysbiosis [20].

Conclusion

What needs to be done to address the malnutrition associated with food insecurity? There is probably not one single solution, and therefore cost-effective multisectoral interventions are needed. For example, subsidising healthier foods, taxing foods and drinks providing empty calories, providing incentives for the production of traditional nutrition-rich staples, influencing healthier food choice through accessible nutrition labelling and nutrition education, and providing subsidised healthy meals at nurseries, schools, in the workplace, and at luncheon clubs might be some potential solutions. The importance of a nutrition-sensitive supply chain should also be recognised. It is important to identify barriers at any point in the supply chain so healthier foods can be distributed ethically and appropriately. Clearly, a sustainable and inclusive economic growth, which aims to reduce income, educational, age, and gender inequality, should be a key policy goal in the successful fight against food insecurity and malnutrition.

Disclosure Statement

I hereby declare that there are no conflicts of interest with regard to this commentary.

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Detection and Management of Malnutrition in Primary Care

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Abstract from Dominguez Castro P, Reynolds CM, Kennelly S, et al.: General practitioners' views on malnutrition management and oral nutritional supplementation prescription in the community: A qualitative study. Clin Nutr ESPEN 2020;36:116–127.

Keywords

Community · Dietetics · General practitioners · Malnutrition · Oral nutritional supplements · Primary care · Qualitative · Undernutrition

Abstract

Background & aims: Malnutrition or undernutrition, arising from a deficiency of energy and protein intake, occurs commonly among community-dwelling individuals in developed countries. Once identified, malnutrition can be effectively treated in the majority of cases with dietary advice and the prescription of oral nutritional supplements (ONS) for patients who can eat and drink orally. However, previous research has reported inadequate screening and treatment of malnutrition in the community. The aim of this qualitative study was to explore general practitioners' (GPs) experiences and opinions on the management of malnutrition and the prescription of ONS in the primary care/community setting in Ireland.

Methods: Sixteen semi-structured interviews including chart stimulated recalls (CSR) were conducted with GPs. The interviews and CSRs explored, among others, the following domains; barriers and facilitators in the management of malnutrition, ONS prescribing in the primary care/community setting, and future directions in the management of malnutrition and ONS prescribing. Recorded interviews were transcribed and analysed following a generic qualitative approach with inductive thematic analysis using NVIVO 12 to facilitate data management.

Results: Three main themes were identified. Theme 1: 'Malnutrition is a secondary concern', encapsulating the idea that the identification of malnutrition is usually secondary to other clinical issues or disease rather than an independent clinical outcome. This theme also includes the idea that obesity is viewed as a dominant nutritional issue for GPs. Theme 2: 'Responsibility for malnutrition and ONS management in the community', highlighting that GPs feel they do not know who is responsible for the management of malnutrition in the community setting and expressed their need for more support from other healthcare professionals (HCPs) to effectively monitor and treat malnutrition. Theme 3: 'Reluctance to prescribe ONS', emerging from the GPs reported lack of knowledge to prescribe the appropriate ONS, their concern that ONS will replace the patient's meals and the costs associated with the prescription of ONS.

Conclusions: GPs in Ireland do not routinely screen for malnutrition in their clinics as they feel unsupported in treating and managing malnutrition in the community due to limited or no dietetic service availability and time constraints. GPs also view malnutrition as a secondary concern to disease management and prioritise referral to dietetic services for patients with overweight and obesity. GPs reported that they have insufficient knowledge to change or discontinue ONS prescriptions. This study demonstrates that there is a clear need for primary care training in malnutrition identification, treatment and management and more community dietetic services are needed in order to support GPs and deliver high quality care to patients.

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Knowledge Transfer

Background

Malnutrition occurs alongside obesity in the Western world. The incidence varies in different age groups and depends on disease status [5]. For elderly people living at home, the rate of malnourishment is 10–14% [8, 13]. Early detection and intervention increase the chance of avoiding manifest malnutrition and may also positively affect quality of life, health and physical functioning, and decrease the risk of falls and disease development [6, 13].

Home-dwelling, self-reliant elderly people mainly visit their general practitioner (GP) while other specialists are only seen in the event of acute illness or increasing frailty necessitating a higher level of assistance with daily living.

Lack of Nutritional Risk Screening in GP Practices

It is common procedure for patients in hospital, nursing home, and home care settings to be regularly surveyed for nutritional risk, with established guidelines available for nutritional status screening. For home-dwelling, self-reliant elderly people, regular screening of nutritional status by a GP is less common, and guidelines are less clear for these patients [1]. Screening for risk of malnutrition is often carried out with validated mapping tools. Some tools are best suited for use in hospital settings while others are more suitable for use in home residents [7, 12].

Conclusion for Clinical Practice

If GPs regularly mapped the nutritional status of elderly patients, nutritional measures could be implemented at an earlier stage and fewer elderly people would be malnourished. This could decrease the financial burden at both the societal and the individual level [4, 9]. For patients, it could decrease ill health, illness, and reduced quality of life [7] as malnutrition increases the risk of illness and falls, delays wound healing and rehabilitation, and can affect mental functioning [11].

In order to map the nutritional status of elderly people living at home, GPs must understand the importance of prevention and treatment of malnutrition, know how to implement nutritional measures best, and perceive it as their responsibility to do so [13]. Guidelines must be established to determine who is to be screened for nutritional risk, how and how often this should be done, and which tools are to be used, in correspondence with existing guidelines pertaining to hospitals, nursing homes, and home care. These guidelines should be based on documented evidence regarding the prevalence of the risk of malnutrition in different population groups and on the tools shown to be most suitable in the primary health care setting [2, 10].

Furthermore, there need to be regular follow-up examinations in relation to risks detected [3, 12]. In busy general practice with little time for the individual patient, this can be demanding to achieve. Nevertheless, there can be no doubt as to the importance of early implementation of measures to prevent malnutrition. Establishing primary care “health teams” consisting of different healthcare professionals could make it easier to regularly map the nutritional status of the most vulnerable patient groups and implement and evaluate

measures early on [2]. The actual screening of a patient’s nutritional status could also be done by a healthcare professional other than the GP, e.g. a nurse. A dietitian could follow up on findings of nutritional risk and malnutrition and possibly recommend a prescription for oral nutritional supplements. Evaluation of implemented measures should be done within an interdisciplinary group setting including the patient, the GP, and those carrying out the nutritional screening and implementing nutritional measures.

Disclosure Statement

I hereby declare that there are no conflicts of interest with regard to this commentary.

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Malnutrition in Inflammatory Bowel Diseases. What do we know today?

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Abstract from Wong K, Isaac DM, Wine E: Growth Delay in Inflammatory Bowel Diseases: Significance, Causes, and Management. Dig Dis Sci 2021;66(4):954–964.

Keywords

Bone mass · Crohn disease · Height · Puberty · Ulcerative colitis · Weight

Abstract

Growth delay with height and weight impairment is a common feature of pediatric inflammatory bowel diseases (PIBD). Up to 2/3 of Crohn Disease patients have impaired weight at diagnosis, and up to 1/3 have impaired height. Ulcerative colitis usually manifests earlier with less impaired growth, though patients can be affected. Ultimately, growth delay, if not corrected, can reduce final adult height. Weight loss, reduced bone mass, and pubertal delay are also concerns associated with growth delay in newly diagnosed PIBD patients. The mechanisms for growth delay in IBD are multifactorial and include reduced nutrient intake, poor absorption, increased fecal losses, as well as direct effects from inflam-

mation and treatment modalities. Management of growth delay requires optimal disease control. Exclusive enteral nutrition (EEN), biologic therapy, and corticosteroids are the primary induction strategies used in PIBD, and both EEN and biologics positively impact growth and bone development. Beyond adequate disease control, growth delay and pubertal delay require a multidisciplinary approach, dependent on diligent monitoring and identification, nutritional rehabilitation, and involvement of endocrinology and psychiatry services as needed. Pitfalls that clinicians may encounter when managing growth delay include refeeding syndrome, obesity (even in the setting of malnutrition), and restrictive diets. Although treatment of PIBD has improved substantially in the last several decades with the era of biologic therapies and EEN, there is still much to be learned about growth delay in PIBD in order to improve outcomes.

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Knowledge Transfer

Background

Inflammatory bowel diseases (IBD) are chronic, often relapsing, conditions. Paediatric IBD (PIBD) is associated with more severe morbidity and a more complicated disease process than adult-onset IBD [1]. The clinical presentation of PIBD varies, including both gastrointestinal (e.g. bloody diarrhoea/abdominal pain in ulcerative colitis (UC) patients or, depending on disease location, even no specific symptoms in Crohn's disease (CD) patients) and extraintestinal (e.g. oral aphthous ulcerations, dermatologic conditions, arthritis) symptoms. Consequently, children with PIBD are at risk of malnutrition, including macronutrient and micronutrient deficiencies, leading to poor growth and often delayed puberty.

Review Results

In the review by Wong and colleagues published in the Digestive Diseases and Sciences Journal [2], the authors describe the clinical presentation of growth delay in PIBD as well as its possible mechanisms and management options (summarized in Fig. 1). The mentioned pitfalls which may occur while treating malnutrition in PIBD are especially interesting for clinical practice.

Clinical Presentation of Growth Delay in PIBD

Weight loss leading to growth failure is observed more often in CD patients than in UC patients, the reason lying in the very nature of the diseases. Every month of delay, from disease onset to diagnosis, is associated with a decrease in height for age. Nevertheless, if remission is achieved, it seems that there is a "therapeutic window" related to growth, i.e. children can continue to grow beyond the

chronologic age at which epiphyseal closure is defined to occur. However, metabolic bone disease is often seen in PIBD, which is associated with decreased bone mineral density (BMD). Consequently, PIBD is associated with suboptimal linear growth which is more evident in CD patients, and may lead to delayed puberty.

Pathogenesis of Growth Delay

Growth delay or delayed puberty in PIBD is multifactorial: Inflammation is a well-documented factor as several pro-inflammatory cytokines affect growth-related hormones, reduce appetite, and increase the metabolic activity of macronutrients. Malabsorption and maldigestion are risk factors for growth failure as well, particularly in the case of small bowel disease location, leading to nutrient and protein losses. Symptoms such as pain, nausea, or diarrhoea may reduce patients' food intake and influence their food preferences. Increased resting energy expenditure is thought to further contribute to increased calorie expenditure; however, this point remains controversial. Other factors such as side effects from medication, alterations in the gut microbiome, as well as physiological factors may also impact on the growth of PIBD patients.

Management of Growth Delay

Exclusive enteral nutrition (EEN) is the first-line therapy for inducing clinical remission in CD. It is given solely as a nutritionally complete formula for 6–8 weeks. While comparable solid food diets for CD patients are promising, EEN is considered equal or even superior to corticosteroid induction therapy. Still, corticosteroids remain an important therapeutic choice. Anti-TNF agents are used as induction

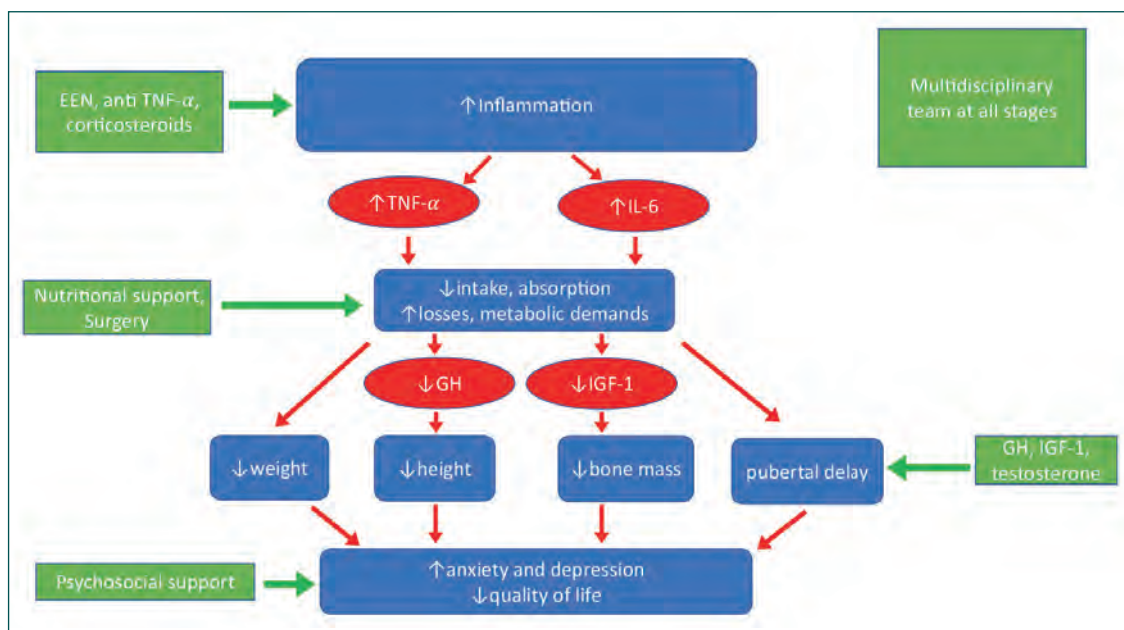


Fig. 1. Overview of clinical manifestations, mechanisms, and interventions in PIBD growth delay: Schematic representation of factors that impact growth delay and its consequences. Not all pathways are completely established; details are provided in the text. Blue: clinical manifestations, Red: mechanisms and biomarkers, Green: interventions [2].

therapy in severe PIBD and have been associated with improved growth. In cases of severe disease refractory to aggressive medical treatment, surgery has been correlated with improvements in linear growth. Overall, PIBD patients should follow the same age-specific dietary recommendations as healthy children, whereas during flares an increase in protein intake by 25% is recommended.

Management of Pubertal Delay

There are reports on endocrine therapies including sex hormones, growth hormones, and insulin-like growth factor-1 for the treatment of growth failure and subsequent pubertal delay in PIBD patients. However, more research is needed before these therapies can be included in clinical practice.

Pitfalls in Managing Weight and Growth Problems

Refeeding syndrome can occur after rapid refeeding in some PIBD patients, especially those with severe weight loss. This leads to severe hypophosphatemia and metabolic abnormalities, and therefore requires particular attention and caution.

On the other hand, obesity is also increasingly seen in IBD patients. Uncontrolled eating after diagnosis, misconceptions of what someone with IBD can or cannot eat, and adherence to a restricted diet

without professional supervision in order to induce or maintain remission can lead to insufficient energy and macro-/micronutrient intake.

In conclusion, due to the dynamic and complex course of IBD, the treatment of paediatric patients with IBD should follow a multidisciplinary approach including paediatric gastroenterologists, nurses, registered dietitians, social workers, and psychologists.

Disclosure Statement

I hereby declare that there are no conflicts of interest with regard to this commentary.

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Determinants of Malnutrition in Older Adults

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Abstract from Katsas K, Mamalaki E, Kontogianni MD, et al.: Malnutrition in older adults: Correlations with social, diet-related, and neuropsychological factors. *Nutrition*. 2020;71:110640.

Keywords

Cognitive status · Community-dwelling · Diet · Elderly · Malnutrition · Nutritional status

Abstract

Background: The number of older adults is increasing rapidly. Malnutrition is a major problem in this age group, which may adversely affect health and quality of life. Several physiological, socioeconomic, and neuropsychological factors can lead to malnutrition.

Objectives: The aim of this study was to evaluate the nutritional status of community-dwelling older adults, and explore the associations of malnutrition risk with physiological, socioeconomic, and neuropsychological characteristics.

Methods: This study is part of the Hellenic Longitudinal Investigation of Aging and Diet study, a cross-sectional observational study in Greece, and study participants were 1831 urban-dwelling elderly individuals (mean age: 73.1 ± 5.9 y; 40.8% men). Risk for

malnutrition was assessed with the Determine Your Nutritional Health checklist. Data on age, sex, level of education, marital status, depression, cognitive performance, body mass index, total energy intake, and adherence to the Mediterranean diet were recorded. Correlations and multivariate analyses were performed between these variables and risk for malnutrition.

Results: The estimated prevalence of moderate and high nutritional risks was 34.8% and 29.4%, respectively. Risk for malnutrition was associated with marital status (unmarried), increased body mass index, male sex, lower level of education, lower cognitive performance, and lower adherence to the Mediterranean diet ($P < 0.05$).

Conclusions: Nutritional screening should be performed frequently in all community-dwelling older adults. Health experts should perform nutritional screening in all community-dwelling older adults as part of secondary prevention, and nutrition counselling and support should be offered in those at risk for malnutrition.

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Knowledge Transfer

Background

Older adults make up an increasingly larger group of the population in European countries. The scientific community recognises the need to promote healthy ageing and quality of life in older age. A number of studies have investigated the impact of several diet-related conditions in older adults, namely malnutrition and the factors associated with nutritional risk. In Greece, the “Hellenic Longitudinal Investigation in Ageing and Diet” study identified several factors related to the nutritional status of community-dwelling older adults, namely marital status, body mass index (BMI), sex, level of education, cognitive performance, and adherence to the Mediterranean diet. Also, there was a high prevalence of moderate and high nutritional risks, with only around one third of the participants being well-nourished. Nutritional screening in the community should be performed routinely, and older adults at risk should have support and nutritional counselling [1].

Malnutrition in Older Adults

Malnutrition is a state that results from a “lack of intake or uptake which can be caused by starvation, disease or advanced ageing (e.g. > 80 years), alone or in combination” [2]. As a consequence, several physiological changes might occur such as loss of muscle mass, impaired immune function, decrease in bone mass, anaemia, poor healing, and cognitive impairment [1]. Malnutrition in older age brings about additional constraints as some of the body functions might already be compromised by the ageing process, resulting in poor prognosis in the case of disease and impaired clinical outcomes.

The most common nutritional risk screening tools validated for older adults are the Mini Nutritional Assessment (MNA), the Malnutrition Universal Screening Tool (MUST), and the Nutritional Risk Screening 2002 (NRS). A prevalence of malnutrition of around 20% was found in studies using the MNA, but there were differences between the settings (rehabilitation, 50.5%; hospital, 38.7%; nursing home, 13.8%; community, 5.8%) [3]. The Determine your Nutritional Health (DETERMINE) Checklist for screening has been used in community-dwelling settings [4]. Risk screening in the community is an essential prevention measure since it allows combatting malnutrition in the early stages and finding nutritional deficiencies before the health status of older adults declines [3].

Determinants of Malnutrition in Older Age

The Hellenic Study found that older adults who were at higher risk of malnutrition were female, unmarried, presented a higher BMI, fewer years of education, lower global cognitive function (GCF), and a lower adherence to the Mediterranean diet. Other conditions increasing the risk of malnutrition were: use of medication (more than

3 drugs per day), an illness or condition that influenced food intake, dental or oral problems, eating few fruits and vegetables or milk products, and eating alone most of the time [1]. Previous research using the same screening tool found similar data, and participants also reported not always having enough money for food [5].

Presenting the factors by section, critical factors for malnutrition in older adults involve oral problems (dental status, difficulties with chewing or swallowing, oral pain, and gum issues), psychosocial circumstances (cognitive function, depression, psychological distress, anxiety, social support, living conditions, access to transport, loneliness, wellbeing), medication and access to healthcare, health (comorbidities, self-perceived health), physical function, and diet. Most of the factors were identified in one or more studies, nevertheless there is a lack of robust evidence for most of the determinants [4, 6].

Conclusion

Although the scientific evidence is not always strong concerning the factors associated with malnutrition, considering the various dimensions of malnutrition and potential causes, it is important to implement risk assessment procedures for older adults living in the community and thus enable proper follow-up of those at risk.

Disclosure Statement

I hereby declare that there are no conflicts of interest with regard to this commentary.

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Association Between Malnutrition and Sarcopenia During Hospitalisation in Older People: A Challenge in Rehabilitation

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Abstract from Pourhassan M, Rommersbach N, Lueg G, et al.: The Impact of Malnutrition on Acute Muscle Wasting in Frail Older Hospitalized Patients. *Nutrients* 2020;12(5):1387.

Keywords

Muscle mass · Muscle strength · Malnutrition · GLIM criteria · Geriatric hospitalized patients

Abstract

Very little is known about the effect of malnutrition on short-term changes of body composition, particularly muscle, among older hospitalized patients. We sought to investigate the association of malnutrition as assessed by the Global Leadership Initiative on Malnutrition (GLIM) criteria with changes of thigh muscle mass and muscle strength among older patients during hospitalization. Forty-one patients (age range 66–97 years, 73% female) participated in this prospective longitudinal observational study. Nutritional status was evaluated using the GLIM criteria on admission and at discharge. Functional status and mid-thigh magnetic resonance imaging (MRI) measurements of cross-sectional area (CSA) were conducted on admission and before discharge. In all, 17%

were malnourished and 83% had no malnutrition. Mean mid-thigh muscle CSA declined by 7.0 cm² (–9%) in malnourished patients during hospitalization ($p = 0.008$) and remained unchanged among non-malnourished patients (–1%, $p = 0.390$). Mean mid-thigh CSA of subcutaneous and intermuscular fat did not change significantly during hospitalization in both groups. Malnourished subjects lost 10% of handgrip strength (–1.8 kg) and 12% of knee extension strength (–1.5 kg) during hospitalization. However, the magnitude of both changes did not differ between groups. In a stepwise multiple regression analysis, malnutrition and changes in body weight during hospitalization were the major independent risk factors for the reduction of muscle CSA. Malnutrition according to the GLIM criteria was significantly and independently associated with acute muscle wasting in frail older patients during 2-week hospitalization.

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Knowledge Transfer

Study Results

This prospective longitudinal observational study by Pourhassan et al. proves that malnutrition, diagnosed according to Global Leadership Initiative on Malnutrition (GLIM) criteria, is a major risk factor for reduced muscle mass in frail older patients during hospitalisation [1]. When malnutrition is combined with physical inactivity, which is prevalent in older people due to bed rest, muscle mass and strength decline. The aim of the study was to examine changes in muscle mass and strength between malnourished and adequately nourished frail older adults during hospitalisation (41 patients, aged 66–97 years). The nutritional status of the patients was examined with the Mini Nutritional Assessment Short-Form (MNA-SF) and GLIM criteria; the patients were then divided into two groups (malnourished and non-malnourished). The Barthel Index was used for geriatric assessment, the SARC-F questionnaire to determine the risk of sarcopenia, the FRAIL scale to assess the risk of frailty, and the Charlson Comorbidity Index to identify medical comorbidities. Additionally, patients underwent an assessment of handgrip strength and isometric knee extension strength. Finally, MRI scans were used to assess mid-thigh muscle, subcutaneous fat, and intermuscular fat cross-sectional area (CSA). All data were collected upon admission to hospital and before discharge (length of hospitalisation ≥ 14 days) [1].

Out of 41 patients, 17% were malnourished and 83% were non-malnourished. The results showed a decrease in mean mid-thigh muscle CSA (9% (7 cm²) according to GLIM criteria, 8% (6 cm²) according to MNA-SF) in malnourished patients between the time of admission and discharge, in comparison to non-malnourished patients. Furthermore, malnourished patients showed a decrease of 10% in handgrip and 12% in knee extension strength. The remarkable finding of this study was that malnutrition according to GLIM criteria constituted the most important risk factor for mid-thigh muscle mass loss during hospitalisation. Body weight changes during hospitalisation were the second most important factor [1].

Conclusion for Clinical Practice

A meta-analysis from 2020 showed that the prevalence of sarcopenia was highest among individuals in nursing homes, followed by older adults staying in hospitals, and lowest in community-dwelling elderly people [2]. Senior citizens in Northern Greece were found to have low energy intakes; an energy intake of more than 25–30 kcal/kg of body weight is needed in order to prevent sarcopenia [3]. Furthermore, it should be taken into consideration that people staying at nursing homes or hospitals have limited choices regarding meals and physical activity while they are on bed rest for several hours. This combination constitutes a crucial risk factor for sarcopenia [2]. An appropriate physical activity program with a balanced diet sufficient in energy and adequate in protein [4] (which is associated with muscle mass and strength maintenance [5]) and other macro- and micronutrients is of great significance in the prevention of sarcopenia [4].

Disclosure Statement

I hereby declare that there are no conflicts of interests regarding this commentary.

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Age and Frailty as Key Determinants for Nutritional Therapy Individualization in Elderly Adults with Diabetes

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Abstract from Tamura Y, Omura T, Toyoshima K, et al.: Nutrition Management in Older Adults with Diabetes: A Review on the Importance of Shifting Prevention Strategies from Metabolic Syndrome to Frailty. *Nutrients* 2020;12:3367.

Keywords

Cognitive impairment · Diabetes mellitus · Elderly · Frailty · Nutrition management

Abstract

The increasing prevalence of older adults with diabetes has become a major social burden. Diabetes, frailty, and cognitive dysfunction are closely related to the mechanisms of aging. Insulin resistance, arteriosclerosis, chronic inflammation, oxidative stress, and mitochondrial dysfunction may be common mechanisms shared by frailty and cognitive impairment. Hyperglycemia, hypoglycemia, obesity, vascular factors, physical inactivity, and malnutrition are important risk factors for cognitive impairment and frailty in older adults with diabetes. The impact of nutrients on

health outcomes varies with age; thus, shifting diet therapy strategies from the treatment of obesity/metabolic syndrome to frailty prevention may be necessary in patients with diabetes who are over 75 years of age, have frailty or sarcopenia, and experience malnutrition. For the prevention of frailty, optimal energy intake, sufficient protein and vitamin intake, and healthy dietary patterns should be recommended. The treatment of diabetes after middle age should include the awareness of proper glycemic control aimed at extending healthy life expectancy with proper nutrition, exercise, and social connectivity. Nutritional therapy in combination with exercise, optimal glycemic and metabolic control, and social participation/support for frailty prevention can extend healthy life expectancy and maintain quality of life in older adults with diabetes mellitus.

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Knowledge Transfer

Background

The world population is undeniably ageing. Even though people live longer, longevity does not come without a price, since it is often accompanied with longer periods of diminished health. Globally, the prevalence of diseases and disabilities associated with older age such as diabetes, heart disease, and cognitive decline along with sarcopenia and frailty is on the rise, posing an increasing burden on global health. These non-communicable diseases which accompany the ageing process are often interrelated, and share common pathophysiological backgrounds and in some cases common therapeutic interventions.

Study results

The study by Tamura and colleagues from late 2020 in *Nutrients* is a comprehensive review of the effects of old age on health parameters in diabetes patients, with a special focus on nutrition and frailty. The first part is a short review of the interaction between old age and diabetes and their independent and combined effects on frailty and cognition. Subsequently, data which show the interplay between glucose dysregulation, frailty, and cognitive impairment and their common pathophysiological traits are presented (fig. 1). The review then focuses on the effects of age and diabetes on nutrient metabolism and body composition. Based on the presented data, the authors suggest that there should be a shift in focus regarding nutrition therapy in older individuals with diabetes towards not only glycemia management but also, and sometimes primarily, the prevention and treatment of frailty and sarcopenia in affected individuals, since in some cases their presence may be more detrimental to the patient's overall health and survival (fig. 2).

Commentary

From a dietitian's point of view, the reviewed paper addresses a very important issue regarding nutrition therapy for older adults with diabetes. The need to prioritize frailty and malnutrition in elderly diabetes patients is not emphasized enough, and no specific recommendations are provided, neither in the recent ADA nutrition therapy consensus for people with diabetes [2] nor in the 2021 "Older Adults: Standards of Medical Care in Diabetes" [3], even though the joined consensus report by ADA and EASD recognizes an urgent need for optimal approaches to diabetes management in frail and older adults [4].

We are well aware of the multiple nutritional problems and increased malnutrition and frailty risk of the elderly population, either as a result of normal aging or as a consequence of multiple morbidities and their therapies [5]. Approximately 1 in 6 community-dwelling people > 65 years old is frail [6], a percentage that increases with age. In elderly people with diabetes, the reported prevalence of prefrailty and frailty can be as high as 51.5% and 19.2%, respectively [7].

Sarcopenia, which is a common phenotype of frailty, is formally recognized as a muscle disease with an ICD-10-MC Diagnosis Code, and its diagnosis is confirmed by three criteria: (1) muscle strength, (2) muscle quantity/quality, and (3) physical performance as an indicator of severity [8]. Although frailty and sarcopenia are distinct entities, they share some common diagnostic criteria, risk factors, phenotypes, and treatments. A low body mass index is common in both and is strongly associated with 5- and 10-year mortality in older adults with diabetes, even more than HbA1c [9]. Inadequate protein intake is a key factor contributing to sarcopenia. Aside from

Fig. 1. Cognitive impairment and frailty in older adults with diabetes. The mechanisms of diabetes, frailty, and cognitive dysfunction are closely related in the context of aging. Insulin resistance, arteriosclerosis, chronic inflammation, oxidative stress, and mitochondrial dysfunction are integrally involved in the pathogenesis of cognitive impairment, frailty, and diabetes mellitus. Obesity, inappropriate nutrition, physical inactivity, hyperglycaemia, and hypoglycaemia can be risk factors for cognitive impairment and frailty in older adults with diabetes. Proper management of body weight, nutrition, and exercise together with optimal glycaemic control are the cornerstones of good health. Figure by [1].

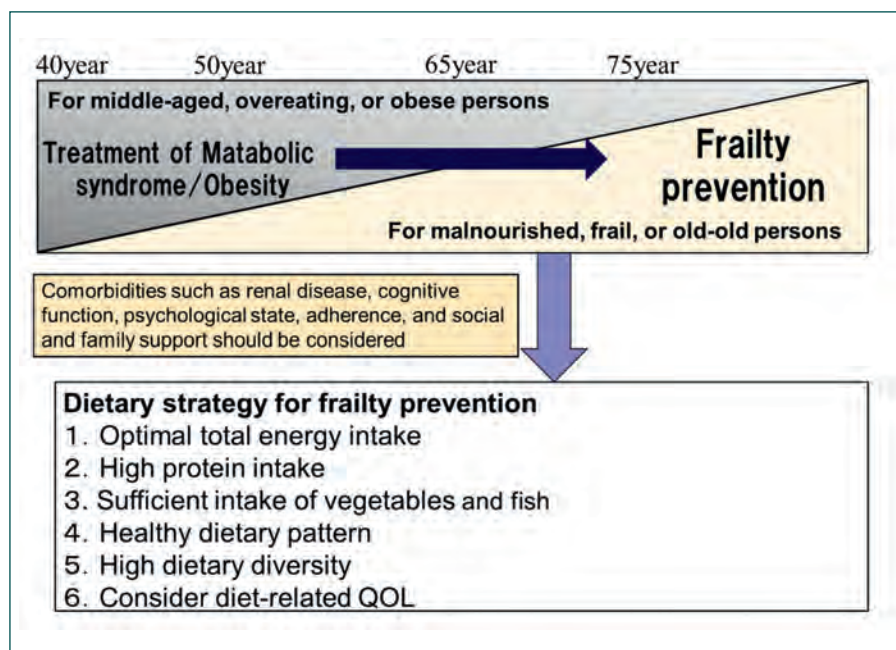
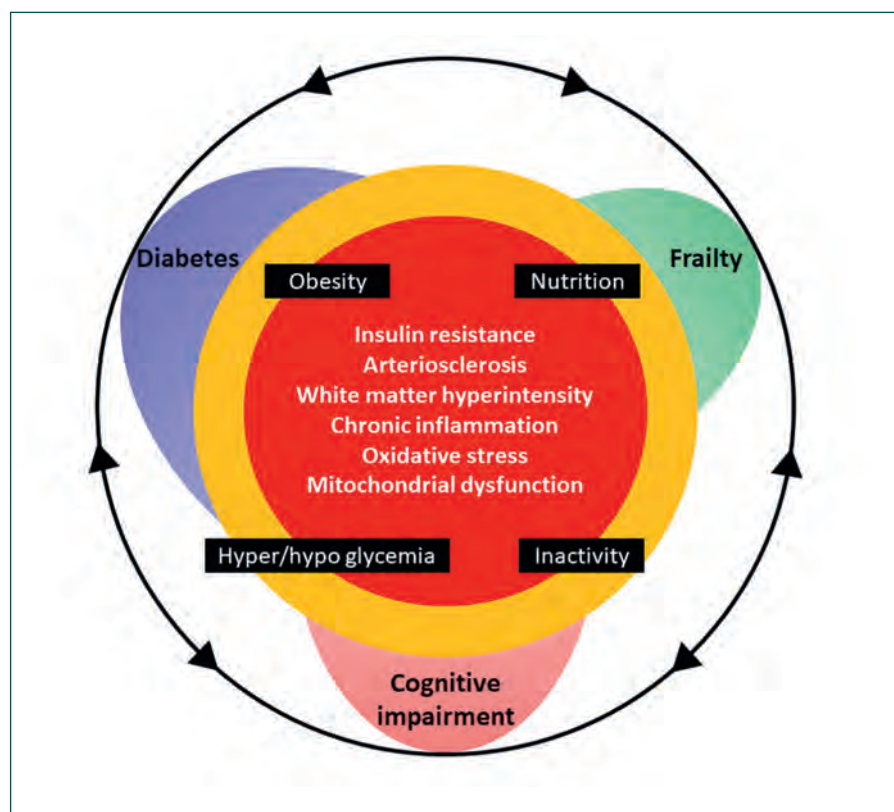


Fig. 2. Shift in dietary strategies for frailty prevention in older adults with diabetes. For the prevention of frailty, optimal energy intake and high protein intake (1.0–1.5 g/kg actual weight) are recommended. High intake of vegetables and fish may be desirable for the maintenance of physical and cognitive function. Healthy dietary patterns including a Mediterranean diet are highly recommended. High dietary diversity may be another approach to the prevention of frailty. In the dietary management in older individuals, maintaining diet-related quality of life is important. QOL, quality of life. Figure by [1].



the general guideline of a dietary intake of at least 1.0 g/kg body weight (BW)/day for older people and > 1.5 g/kg BW/day for those with severe illness and no contraindications such as renal disease [10], there are recommendations that older people should have a protein intake of 25–30 g per meal with about 2.5–2.8 g leucine in order to surpass the higher anabolic threshold of dietary protein/ amino acid intake in older individuals [11]. Recently, new scientific studies have started to address this matter with practical guidelines [12].

An issue which is not addressed in the current review but plays a very important role in food intake and the pleasure of eating is the effect of age, cognition, medications, and disease therapies on the decline in the gustatory and olfactory senses of elderly people. These senses greatly regulate food intake, and their decline can lead to undesirable food behaviours and malnutrition. Yet they are not included as a separate section in any of the available nutritional risk screening tools [13].

Conclusion for clinical practice

As dietitians, we are expected to and should provide dietetic advice based on evidence-based recommendations. When treating elderly individuals with diabetes, we should identify and address all nutritional problems, always keeping in mind the special nutritional needs and difficulties of this fragile population. Strict glycaemic and metabolic control through restrictive diets in relation to either energy or macro-/micronutrients might not be in the best interest of all patients, especially those with frailty and cognitive impairment, and we should prioritize those issues that are most important

with the ultimate goal of helping our patients achieve the best quality of an as healthy as possible life.

Disclosure Statement

I hereby confirm that there are no conflicts of interest with regard to this commentary.

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Bariatric Surgery as the Culprit of Malnutrition

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Abstract from Lange J, Königsrainer A: Malnutrition as a complication of bariatric surgery – a clear and present danger? *Visc Med* 2019; 35:305–311.

Keywords

Malnutrition · Nutritional status · Obesity · Postoperative monitoring · Sleeve gastrectomy

Abstract

Obesity is a chronic life-threatening disease, and bariatric surgery is the most effective treatment in those patients. The two main operations are laparoscopic sleeve gastrectomy (LSG) and Roux-en-Y gastric bypass (RYGB). LSG carries a smaller risk for nutritional deficiencies, while gastric bypass procedures are associated with increased nutritional deficiencies because the procedure is more complex and changes the gastrointestinal anatomy. Recent studies comparing LSG and RYGB have proven that these types of

operation may lead to a similar weight reduction effect but cause different micronutrient deficiencies. Types of malnutrition after bariatric surgery include protein-energy malnutrition and deficiencies of micronutrients, such as iron, folate, vitamin A, and vitamin B₁₂. Bariatric patients who do not adhere to the recommended diets are at a greater risk of developing relevant malnutrition. Therefore, life-long postoperative clinical and laboratory monitoring is necessary to diagnose deficiencies of vitamins, trace elements, and minerals and to correct them with supplements. Unfortunately, no standardized aftercare regimes exist for these patients, and the costs for nutritional supplements are paid by the patients themselves.

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Knowledge Transfer

Background

With at least 2.8 million people dying every year from comorbidities linked to obesity, therapeutic options beyond lifestyle changes are continuing to attract great attention. Data from the longest study on patients who underwent bariatric surgery showed significant improvement in quality of life and reductions in mortality rates from chronic diseases (fig. 1) [1]. Despite positive outcomes, specific types of bariatric surgery are associated with an increased risk of nutritional deficiencies [2].

The latest guidelines published by the German Society for Metabolic & Bariatric Surgery highlight the need for pre- and postoperative assessments of micronutrient status, especially among women [2]. A review by Lange and Königsrainer [3] focused on the topic of

malnutrition after bariatric surgery and identified iron, folate, vitamin A, and vitamin B₁₂ as the most common nutrients of concern alongside protein-energy malnutrition. The review highlights the key deficiencies linked with each type of bariatric surgery and provides recommendations for their treatment.

Study Results

Bariatric surgery is an increasingly common treatment for severe forms of obesity. As a procedure with low mortality rates, bariatric surgery is an effective tool against obesity in addition to protecting against cardiovascular disease and lowering cancer mortality. However, the extensive changes in the gastrointestinal anatomy are often linked with an increased risk of postsurgical malnutrition. The review by Lange and Königsrainer identified a higher risk of malnutrition for more complex operations that change the gastrointestinal anatomy significantly [3]. According to the review and the latest German guidelines on the care of patients undergoing bariatric surgery, preoperative screening for micronutrient deficiencies is required, and treatment of these deficiencies prior to surgery is strongly recommended. Patients receiving restrictive surgery are likely to require supplementation for iron and vitamin B₁₂ and, to a lesser degree, for zinc, calcium, and vitamin D₃. On the other hand, patients undergoing malabsorptive procedures will require lifelong supplementation of many micronutrients. They will also require additional attention to ensure adequate protein intake to avoid developing sarcopenic obesity.

Finally, it is important to highlight the need for annual testing for deficiencies, as the lack of standardized care and the failure of health insurances to cover the cost of supplements create conditions that promote underdiagnosis and suboptimal nutritional care for those patients.

Key Malnutrition Considerations after Bariatric Surgery

1. In restrictive operations (gastric band and sleeve gastrectomy): Limited impact on metabolic needs, however micronutrient deficiencies are common due to reduced food consumption. Patients should be checked for B vitamin deficiencies, especially B₁ and B₁₂. Symptoms of beriberi may appear and should be treated with intravenous administration of 100 mg vitamin B₁.

- A quarter of all patients will require regular supplementation for B₁₂ (1,000–3,000 µg every 3–6 months; exception: patients with a gastric band).
- Iron deficiency is common in more than half of the patients and is often persistent, with low ferritin levels up to 5 years post operation. Iron deficiency often requires intravenous treatment.
- Zinc, calcium, and vitamin D₃ supplementation is required in > 25% of patients.

2. In patients undergoing malabsorptive procedures: Malabsorptive procedures are associated with malabsorption and maldigestion of a variety of micronutrients. It is recommended that all patients are screened and treated for deficiencies before undergo-

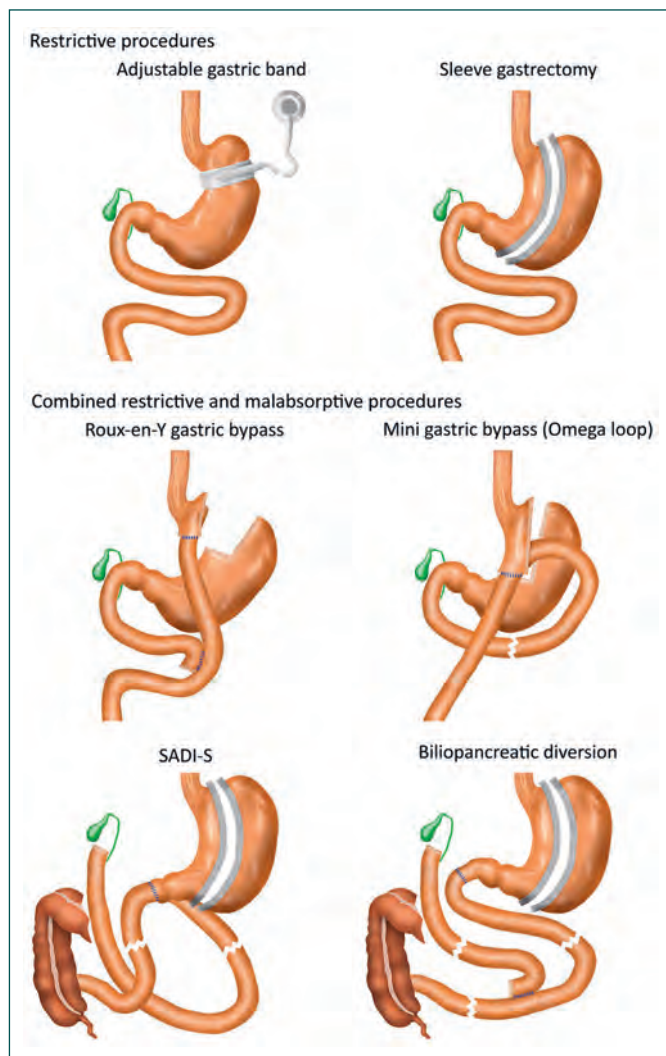


Fig. 1. Commonly performed bariatric surgeries divided into restrictive (adjustable gastric band, sleeve gastrectomy) and malabsorptive (Roux-en-Y gastric bypass, mini gastric bypass, SADI-S (single anastomosis duodenojejunal bypass with sleeve gastrectomy), biliopancreatic diversion) procedures. Image by [3].

ing bariatric surgery.

Recommended supplements for this patient group:

- 1,000–3,000 µg of vitamin B₁₂ every 3–6 months.
- 45–60 mg/day of elemental iron (50–100 mg/day for young women).
- Daily administration of vitamin B₁ at 1.1 mg and 1.2–1.5 mg for women and men, respectively. In the case of neurological disorders linked to thiamine deficiency, intravenous/intramuscular administration of 100 mg thiamine (B₁) is recommended, often combined with magnesium and other B complex vitamins.
- Vitamin D at a prophylactic dose of 3,000 IU/day. A strong recommendation is made for the screening and treatment of vitamin D deficiency before surgery.
- Calcium at a minimum dose of 3,000 IU/day; higher doses are required after a biliopancreatic diversion with duodenal switch.
- A daily dose of 8–15 mg zinc with a strong recommendation for preoperative screening and annual postoperative assessment of zinc sufficiency for Roux-en-Y gastric bypass and biliopancreatic diversion with duodenal switch.
- A daily dose of 2 mg copper.
- A daily dose of 300 mg magnesium citrate.
- Vitamin A deficiencies (common up to 4 years post operation) should be treated with a daily dose of 5,000–10,000 IU/day.

On a general note, patients following malabsorptive bariatric procedures are advised to secure a 1.5 g/kg ideal weight protein intake coupled with exercise for muscle mass maintenance. This is increased to 2.2 g/kg/day for obese patients in intensive care units.

General Remarks

Patients planning bariatric surgery should be screened and treated for micronutrient deficiencies prior to surgery. The majority of patients undergoing malabsorptive procedures will require lifelong supplementation of a range of micronutrients, which creates a cost often not covered by their insurance. Due to the lack of standardized guidelines for care, deficiencies are often overlooked in this population.

Disclosure Statement

I hereby declare that there are no conflicts of interest with regard to this commentary.

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Novo Nordisk and the University of Toronto announce joint 200 DKK million investment to address diabetes and chronic disease prevention

Novo Nordisk A/S and the University of Toronto (U of T) today announced a DKK 200 million (EUR 27 million) investment to establish the Novo Nordisk Network for Healthy Populations. The network will focus on new ways to support healthier urban populations and will draw on U of T's leading expertise in public health research and education programmes to impact the global fight against diabetes and other serious chronic diseases. Based at U of T Mississauga, the new network will be a partnership between the Dalla Lana School of Public Health, the Temerty Faculty of Medicine and U of T Mississauga. "As we commemorate the 100th anniversary of the discovery of insulin at U of T, we are thrilled to once again partner with Novo Nordisk, a company that understands the vital importance of helping those living with diabetes and other chronic diseases," said U of T President Meric Gertler. "Their historic investment will build capacity for research and education at the university. It will bring together existing expertise from across U of

T, our health sector partners in the Mississauga community and the broader region. It will make a real difference to people coping with chronic diseases,, not just here in Canada, but around the world."

In 1921, a U of T research team of Frederick Banting, Charles Best, John J. R. MacLeod and James Bertram Collip discovered insulin. Novo Nordisk predecessors, Nordisk Insulin Laboratorium and Novo Terapeutisk Laboratorium, were among the first to produce insulin at a large scale, bringing this life-saving treatment from U of T laboratories to people with diabetes around the world. Now, 100 years later, U of T and Novo Nordisk will once again work together to improve the lives of people living with diabetes – with an ambition to prevent type 2 disease.

"Fulfilling our company's purpose to defeat diabetes, obesity and other serious chronic diseases requires much more than innovative medicine," said Lars Fruergaard Jørgensen, CEO and President of Novo Nordisk. "One hundred years after the discovery of insulin,

we're proud to once again partner with the University of Toronto with the ambition of helping society to address the root causes of type 2 diabetes and obesity. As we recognise insulin's success in saving millions of lives around the world, we are excited to expand our commitment towards the prevention of these serious chronic diseases."

Novo Nordisk is donating DKK 100 million (EUR 13.5 million) to the network, which is being matched by U of T with further DKK 100 million in financial and in-kind contributions. In addition, Novo Nordisk has made an additional DKK 10 million (EUR 1.35 million) donation to U of T's Banting and Best Diabetes Centre in support of discovery research and to honour Banting and Best's enduring legacy

Further information at
Novo Nordisk A/S
www.novonordisk.com

Bayer launches The Nutrient Gap Initiative to expand access to vitamins and minerals for 50 million people annually worldwide by 2030

As a part of the company's vision of "Health for All, Hunger for None," Bayer is launching "The Nutrient Gap Initiative", which expands access to vitamins and minerals for underserved communities to help combat malnutrition. The program's goal is to reach 50 million people in underserved communities per year by 2030 through direct action and in partnership with critical non-governmental organizations (NGOs) with a focus on intervention, education, and advocacy. The Nutrient Gap Initiative is the first program that will impact Bayer's Consumer Health division sustainability commitment to enable access to everyday health for 100 million underserved people, by 2030.

Access to the right nutrients during the first 1000 days of life – during pregnancy and through the first 2 years – is critical to a mother's health as well as the healthy growth and development of a baby. Unfortunately, vitamin and mineral deficiencies are a major public health problem in underserved communities, with women and children being particularly vulnerable. Almost 50% of young women and adolescent girls in low- and middle-income countries have inadequate

vitamin and mineral intake [1] and at least half of the children worldwide under age 5 suffer from this deficiency [2]. The consequences of vitamin and mineral deficiencies worsen gradually over time, resulting in significant health consequences across the lifespan and ultimately exacerbating the cycle of poverty.

"As a leader and expert in supplemental nutrition, we know how important these nutrients are to help ensure health for all, particularly for vulnerable populations who need it most, like underserved women and children," said Heiko Schipper, President of the Consumer Health Division of Bayer AG and Member of the Board of Management. "Having a healthy baby is a concern for every parent and parent-to-be everywhere around the world and through The Nutrient Gap Initiative, we plan on creating programs that will help give babies the best start in life today and for generations to come."

The company's work will begin with a focus on pregnant women and babies, given they are among the most vulnerable and need even more support due to the impact of COVID-19. Preventing vitamin and mineral

deficiencies early in pregnancy can help mitigate poor pregnancy outcomes, such as stunted growth and impaired neurological development, which lead to long-term health and economic consequences for individuals and societies. As the global leader in prenatal supplements, Bayer is committed to helping all parents and parents-to-be have a happy and healthy baby and is working with several partners to bring prenatal interventions to underserved communities.

The Nutrient Gap Initiative begins immediately and will be focused on communities that need access to life-changing vitamins and minerals most, in keeping with our vision, "Health for All, Hunger for None."

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Further information at
Bayer AG
www.bayer.com

DSM and TU Delft establish artificial intelligence laboratory to drive bioscience innovation

Royal DSM, a global science-based company in Nutrition, Health and Sustainable Living, and TU Delft, ranked among the top universities in biotechnology research globally, announced on January 11, 2021 the establishment of the Artificial Intelligence Lab for Biosciences (the AI4B.io Lab). This laboratory will be the first of its kind in Europe to apply artificial intelligence (AI) to full-scale biomanufacturing, from microbial strain development to process optimization and scheduling.

The AI4B.io Lab will be part of the Dutch National Innovation Center for AI (ICAI), which works to keep the Netherlands at the forefront of knowledge and talent development in AI. It will be led by Prof. Marcel Reinders, Director TU Delft Bioengineering Institute. DSM regards biosciences as an important tool for addressing climate change and resource scarcity and optimizing the global food system, and so will invest EUR 2.5 million into the laboratory over the first 5 years.

With more than 150 years of experience, DSM has already developed an extensive portfolio of sustainable, bio-based solutions that help address some of the key challenges facing society. Now, developments in the understanding of

biology, as well as major advances in digital transformation, are opening up exciting possibilities for new bio-based products, applications, and manufacturing processes. Integrating biosciences and digital technologies can help to reduce the time spent on innovation cycles, from prototyping to scaling and commercialization.

Bringing the desired objective to life, digitally

Traditionally, scientific research is based on trial and error within multiple sub-studies that work together toward a specific objective, such as a new product or production technology. What makes AI unique is that it allows scientists to invert this process. The desired objective is brought to life in a digital environment using 'digital twins' (a virtual 'mirror' of the desired real-world situation), while machine learning helps determine how to achieve it. Although AI is already widely applied in engineering research – for instance, to replace physical wind turbines or tunnels with digital twins – the AI4B.io Lab will be the first of its kind to explore the potential of AI in biosciences and biotechnology.

No innovation without collaboration

Working closely together with partners can drive progress and create access to new technologies. For this reason, DSM decided to partner with TU Delft in setting up and developing the AI4B.io Lab. It will be the third ICAI Lab on the TU Delft campus, joining the AI for Retail Lab Delft of Ahold Delhaize, and the AI for Fintech Lab of ING. Additionally, TU Delft will invest in 24 interdisciplinary AI laboratories on a broad range of topics to further drive collaboration between scientists working in AI and scientists from other domains. The AI4B.io Lab will also collaborate with Planet B.io, the open-innovation ecosystem at the Biotech Campus Delft – for instance, by providing research insights and consultancy to biotechnology startups on the campus. Both DSM and TU Delft are founding partners of Planet B.io.

Further information at
DSM
www.dsm.com

Antisense oligonucleotide candidate derived from Secarna Pharmaceuticals' LNAplus™ platform has entered pre-clinical safety trials for the treatment of elevated blood lipids

Secarna Pharmaceuticals GmbH & Co. KG ("Secarna"), a biopharmaceutical company focusing on the discovery and development of next-generation antisense oligonucleotide (ASO) therapies to address challenging or previously undruggable targets via its LNAplus™ platform, today announced that the company's partner, Lipigon Pharmaceuticals AB, has selected a candidate drug (*Lipisense*) to treat elevated levels of plasma lipid triglycerides. The candidate is being developed for patients suffering from severe hypertriglyceridemia as well as the rare disease Familial chylomicronemia syndrome (FCS), diseases that may lead to painful and potentially life-threatening acute pancreatitis.

Lipisense, an ASO that has been developed with Secarna's proprietary LNAplus™ platform, is a first-in-class treatment with a novel mechanism of action central for the regulation of plasma triglycerides and other plasma lipids. The drug candidate hinders the cellular production of ANGPTL4, a protein that has a direct role in lipid metabolism by blocking the clearance of triglycerides. The protein

has been associated with tumour progression and has shown a strong genetical validation and correlation with harmful plasma lipids and the associated diseases. By hindering the production of ANGPTL4 in the liver by specifically targeting its protein-coding RNA, Lipisense has great potential for the treatment of lipid-related diseases.

The LNAplus™ ASO-based drug candidate has shown strong efficacy in experimental disease models and a good safety profile in preliminary safety studies. Lipigon will now continue preclinical development with Investigational New Drug (IND)-enabling studies; CMC activities have commenced.

Jonas Renz, Managing Director and co-founder of Secarna Pharmaceuticals, said: "We are excited for our partners at Lipigon to have identified an ASO-based candidate drug derived from our proprietary LNAplus™ platform as a first-in-class drug for the treatment of lipid-related diseases. We congratulate the team on entering into pre-clinical safety trials, as together we aim to provide a new line of treatment for patients with severe life-threatening diseases."

About Secarna's proprietary drug discovery platform, LNAplus™

For discovering, testing and selecting ASOs for pre-clinical and clinical development, Secarna employs its proprietary, customized LNAplus™ drug discovery platform. LNAplus™ encompasses all aspects of drug discovery and pre-clinical development and has proven to be fast, reliable, scalable, efficient and to provide for a uniquely integrated workflow, enabling the discovery of novel antisense-based therapies for challenging or currently undruggable targets. The platform includes the powerful proprietary Oligofyer™ bioinformatics and LNA Vit(r)ox™ screening system for best-in-class high-volume screening, and target-specific functional assays. Secarna's platform and ASOs have been validated by numerous in-house projects as well as in several academic and industry collaborations.

Further information at
Secarna Pharmaceuticals GmbH & Co. KG
www.secarna.com

Hypocaloric Peripheral Parenteral Nutrition Administered in Intestinal Reconnection Postoperative Patients with 3–5 Days Oral Fasting Indicated: A Case Report

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Keywords

Parenteral nutrition · Colorectal neoplasms · General surgery

Abstract

Postoperative patients of intestinal reconnection in Morelia, Mexico, are usually in for 3–5 days of oral fast, which increases protein catabolism in the patient, thus lengthening their hospital stay and increasing the risk of developing metabolic comorbidities. Hypocaloric peripheral parenteral nutrition (HPPN) reduces proteolysis and improves inflammatory markers in these patients. The aim of this case report is to determine whether or not peripheral parenteral nutrition (PPN) improves inflammation, lessening the postoperative risk. A 62-year-old female patient and her cancer diagnosis

and intestinal reconnection surgery are discussed. PPN is not commonly used in this type of patients due to the short duration of the fast, although its use is common before surgery. However, postoperative use can be beneficial as well, and given the delicate postoperative state these patients are in, it is worth it (at least in these cases) to give them all the strength and tools available for a better recovery. PPN in the case discussed herein improved the patient's inflammatory marker levels in a shorter period.

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Introduction

Patients who have undergone intestinal reconnection surgery after an oncological diagnosis in Morelia, Mexico, usually have indications for oral fasting for a duration of 3–5 days, according to their state and the presence of surgical complications. This, however, limits their necessary nutrient intake and in consequence promotes endogenous catabolism, thus elongating their hospital stay. Patients with gastrointestinal tumors are especially at risk for malnutrition complications relative to their diagnosis, hospitalization, and treatment (major surgery elicits a state of hypermetabolism for high-energy demands); factors that compromise the patient's ability to react to fasting periods and prognosis in general [1, 2].

Peripheral parenteral nutrition (PPN) is a powerful tool that can go a long way toward economizing protein energy, thus avoiding gluconeogenesis, muscular depletion, metabolic stress that further decreases anabolic hormones and increases catabolic ones, systemic inflammation, and sepsis [3].

Given that scarring is a protein-guided process (through hemostasis, inflammation, and tissue formation), a nitrogen balance in these patients is fundamental. A protein deficit can be associated with poor scarring and wound closing [4]. In this manner, inflammatory state, protein catabolism, and scarring process are associated and depend on each other.

Starvation during a metabolic stress process is different from a physiological fasting period. Surgery by itself is already a stress inducer in the organism that in turn promotes metabolic stress.

Table 1. Screening Tool for CONUT

Parameter	Undernutrition degree			
	normal	mild	moderate	severe
Serum albumin, g/dL	≥3,5	3,0–3,49	2,5–2,99	<2,5
Score	0	2	4	6
Total lymphocyte count, /mm ³	≥1,600	1,200–1,599	800–1,199	<800
Score	0	1	2	3
Total cholesterol, mg/dL	≥180	140–179	100–139	<100
Score	0	1	2	3

Biochemical indicators that reflect an individual's nutritional state, calculated by adding the scores of serum albumin, total lymphocyte count and total cholesterol. Modified by Ulibarri et al. [6]. CONUT score: Serum albumin + total lymphocyte count score + total cholesterol score. Undernutrition states: normal (score 0–1); mild (score 2–4); moderate (score 5–8); severe (score 9–12).

This is expected to be met by a strong metabolic response, which is fueled by a proper nutritional organic state for inflammation to stop spreading and healing to begin promptly [5].

To determine if a patient is at risk nutrition-wise, a clinical picture is yet to be established, which is why clinicians need to be able to interpret anthropometric, biochemical, clinical, and dietary data to assess the patient's nutritional state. The Controlling National Status score (CONUT) is the currently most accepted method for this determination, and its cutoff points are presented in Table 1 [6].

The aim of this case report is to determine if an inflammatory state derived from surgery shows improvement after hypocaloric PN (HPPN) administration (thereby lessening postsurgical risks), aside from the one in the patient's nutritional status.

Case Presentation

A 62-year-old female patient was admitted to a hospital in Morelia, Michoacán, with a diagnosis of ovarian cancer and gastrointestinal stromal tumor, with no previous oncological treatment, for a surgical plan for resection of the gastrointestinal stromal tumor, salpingo-oophorectomy, and entero-enteral anastomosis. The tumor was resected from the descending colon with the sigmoid colon as an anatomical limit, and the oncological diagnosis had been confirmed in a prior biopsy that led to the surgery herein discussed.

Upon arrival, a Penrose drain was placed during surgery for post-surgical fluid quantification to take into consideration together with oral diet tolerance for discharge. In addition, a consult for clinical nutrition was requested to assess nutritional state and administration of HPPN postoperatively. A Nutrition Care Process was initiated:

Anthropometric: the patient had a BMI of 23.7 (45.8 kg, 1.39 m), with a regular weight of 46 kg (ideal weight of 42.5 kg, considering the proposed formula: $22 \times \text{height}^2$ [m]) [7].

Biochemical: upon admission, the patient's CONUT was scored at 9, without considering the total lymphocyte count (2.4 g/dL albumin, 88.3 mg/dL cholesterol), indicating severe malnutrition. Furthermore, C-reactive protein of 18 mg/dL demonstrated sys-

temic inflammation. On postoperative day 1, albumin and cholesterol levels dropped to 2 g/dL and 39 mg/dL, respectively, with an increase of CRP to 108 mg/dL. In contrast, these same parameters at discharge showed the following: albumin of 3.2 g/dL, cholesterol of 125 mg/dL, and a CRP of 48 mg/dL, suggesting an important improvement of the nutritional state (from severe to mild-to-moderate malnutrition), apparently, even though in this case we can presume that the improvement was in the patient's inflammatory state. The patient's biochemical evolution during hospital stay can be seen in Figure 1.

Clinical: vital signs during hospital stay were documented, where arterial pressure ranged from 102/68 to 87/61 mm Hg minimum, average temperature of 36.3 °C (with only one spike to 37.6 °C on day 3), and lowered peristalsis until normalization on day 4. Drain quantification decreased gradually, starting on postoperative day 1 with 116–7 mL on day 6 (discharge).

Dietary: HPPN was administered with 50 g of amino acids, 150 g of dextrose, 1 multivitamin bottle, ½ of an oligo element ampule, and 1 g of ascorbic acid. This resulted in a hypocaloric solution of 800 kcal (17.46 kcal/kg) and a positive nitrogen balance of +1.01 g/N (taking into account a protein catabolism of 43.69 g, obtained from a urine urea nitrogen of 6.99 g). HPPN was administered since the first postoperative day, 1.5 L that contained the aforementioned nutrients and an osmolarity under 600 mOsm/L, every 24 h for 3 days. Oral diet reintroduction was performed on postoperative day 4 with no difficulty, accomplishing adequate food digestion, absorption, and excretion without symptoms.

Discussion and Conclusion

The use of PPN in postoperative recovery of oncologic patients is rare because in most cases, short-term fasting is a safe option. However, the patient in the case presented here displayed a better scarring process with less inflammatory distress due to this approach. Data from a patient of a similar history not treated with PPN showed a decrease in albumin levels from 3.6 at admission to 2.4 g/dL at discharge, and a cholesterol descent of 98.3 to 58.2 mg/dL. The mentioned parameters could have decreased abrupt-

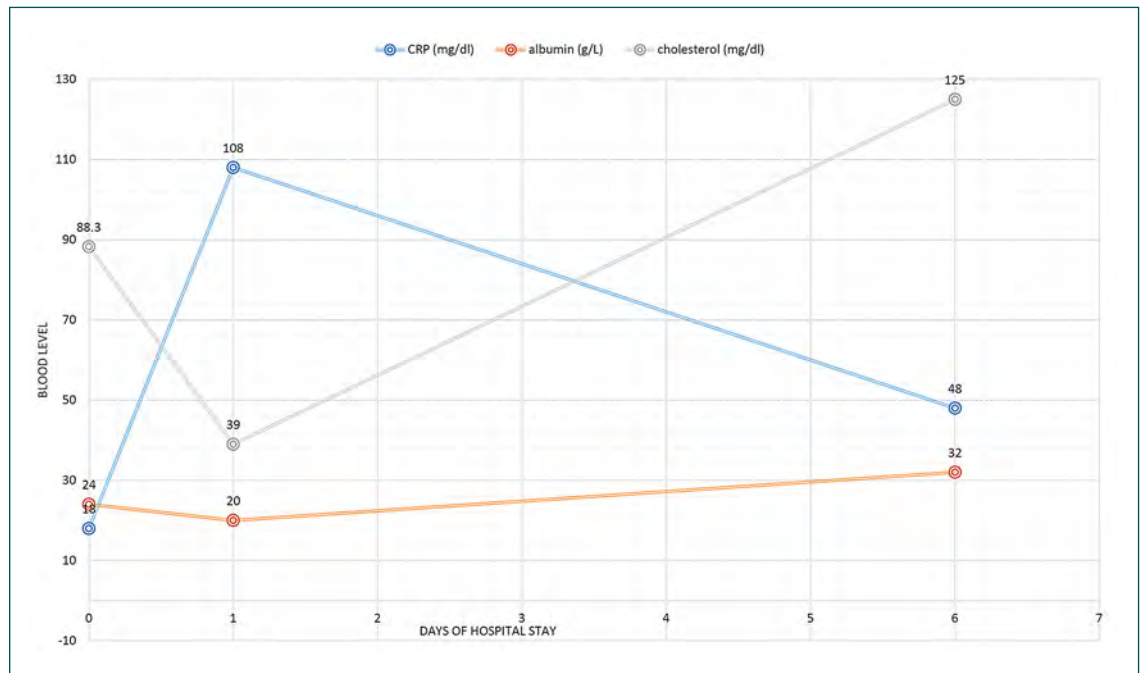


Fig. 1. Biochemical evolution during hospital stay. Day 0 is at admission, day 1 is after surgery, and day 6 is at discharge. Both albumin and cholesterol levels were below normal at admission, decreased postoperatively, and normalized towards discharge. CRP levels (inflammation marker) remained elevated throughout. However, they increased after the intervention and showed great improvement near discharge.

ly due to the surgery's aggressive component and not because of a nutritional lack. General guidelines describe PN as necessary in patients who are well nourished after 7 days, in patients at risk for malnutrition after 3–5 days, and in patients with total inability to ingest oral or enteral food immediately [8]. However, in this case (as in others alike), 3 days were enough to impact recovery, as others have documented as well. Pinzón et al. [9] determined that PN should initiate as soon as nutrient requirements are not met > 60%. Recent studies have also uncovered proof of the efficacy this therapeutic nutritional plan can have as a prophylactic measure for malnutrition and sepsis prevention [8].

Nutritional support is a more effective option when it is administered preoperatively, thus helping to avoid complications during postoperatively by strengthening the patient's nutritional status. However, in emergency cases where surgery is needed, a postoperative approach of PN is reasonable if we wish to decrease the risk of malnutrition and the complications it brings along.

HPPN was used in this case due to insufficient resources; however, PPN seems to be the better choice. PN as an immediate intervention in postoperative patients of intestinal reconnection is not the current standard of care; nonetheless, biochemical as well as clinical outcomes in the patient reported here show a clear benefit for reducing inflammation, and by proxy, malnutrition risk or anastomosis leak.

Statement of Ethics

The patient described in this case report gave written consent to use the relevant information for publication. The hospital where the case was studied also gave written permission to gather the information needed for the manuscript.

Disclosure Statement

The authors have no conflicts of interest to declare.

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Author Contributions

Jesús Manuel De Aldecoa-Castillo carried out the acquisition of the patient data and helped draft the manuscript. Tamara Daniela Frydman was instrumental in the manuscript preparation. Daniela Rubio-Mendoza and Carlos Alvarado-Vargas supervised the case and patient data acquisition, and prepared the outline for the publication. Melchor Alpizar-Salazar edited the manuscript and gave approval to the final version.

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References to this article are available at www.karger.com/doi/10.1159/000516241.

The Range of European Nutritional Practice – Inspiring and on the Point



Nutrition screening and management is essential for the recovery of patients in the ICU. ©Akiomaru

German Society of Nutritional Medicine (DGEM) Intensive Care Patients with COVID-19 Often Malnourished

The term malnutrition is used very differently in lay and professional circles, and even among experts there were no internationally binding criteria for it for a long time. It was only about two years ago that a globally valid catalogue of criteria was compiled. This catalogue covers disease-related malnutrition as well as nutrient or energy deficiencies caused by hunger or malnutrition. "According to this, malnutrition does not always mean that those affected do not take in enough food," explains Professor Anja Bosity-Westphal, President of the DGEM. Disease-related disorders of digestion, absorption and utilisation of nutrients, or an increased energy requirement can also lead to an insufficient supply. Accordingly, underweight as well as normal or even overweight patients could be malnourished. "A low body mass index is thus only one of the possible criteria – unintentional weight loss or low muscle mass can also be signs of malnutrition," says Bosity-Westphal.

According to the criteria of the catalogue, the French doctors classified 42.1% of the COVID-19 patients admitted to a normal ward as malnourished – 18.4% even as seriously malnourished. Of those patients who had previously been cared for in an ICU, as many as two-thirds were malnourished. The study could not distinguish whether the patients' poor nutritional status stemmed from the COVID-19 disease or had already existed before. "However, it can be assumed that it was at least intensified by the disease," says Professor Matthias Pirlich, 2nd Vice President of the DGEM. This is because COVID-19 brings with it many symptoms that make eating difficult – such as loss of smell and taste, severe fatigue and nausea. At the same time, there is a great loss of energy and nutrients due to diarrhoea and high fever. The pronounced inflammatory reaction leads to a breakdown of the musculature. Even though the significance of the observed deficiencies for the further course of

the disease is still unclear, the experts of the DGEM consider the high proportion of malnourished COVID-19 patients to be a clear alarm signal. This is because it is known from studies on numerous other diseases that a good nutritional status can make a valuable contribution to recovery. The professional society therefore considers it urgently necessary to examine the nutritional status of COVID-19 patients upon admission to hospital and, if necessary, to provide them with nutritional medical care during their stay in hospital.

Literatur

Bedock D, Bel Lassen P, Mathian A, et al.: Prevalence and severity of malnutrition in hospitalized COVID-19 patients. *Clin Nutr ESPEN*. 2020;40:214–219.



www.dgem.de

Irish Nutrition & Dietetic Institute World Cancer Day Theme 2021: I Am and I Wil

For World Cancer Day (WCD) 2021 the Irish Nutrition & Dietetic Institute (INDI) and the Irish Cancer Prevention Network (ICPN) teamed up to increase public awareness about the impact of eating for health to reduce cancer risk. World Cancer Day is an international awareness day held each year on the 4th February. The day seeks to raise awareness of cancer and empower individuals, populations and governments to take action to prevent and tackle cancer. This year's WCD theme, 'I Am and I Will', fo-

cused on the power that each person has to reduce the global impact of cancer. For World Cancer Day 2021, the INDI and ICPN held a free public webinar about eating for health to reduce cancer risk. The webinar "Food for thought: Eating to Reduce Cancer Risk" was live on Thursday 4th February at 13:00–13:45. It was delivered by Dr Heather Burns, Consultant in Public Health Medicine at the National Cancer Control Programme and Sarah Keogh, Consultant Registered Dietitian at

INDI. Over 3,700 people signed up to watch the webinar and the link was shared with all registrants afterwards. The webinar is available on the INDI website to watch in your own time and we hope you find it useful and informative.



www.indi.ie/news-centre/news.html

Faculty of Nutrition and Food Sciences of Porto University NutriEduca – Food and Nutrition Education in a School Context



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The low levels of food and nutritional literacy among the school community were determinant for the problems encountered, such as snacks rich in processed and ultra-processed foods, and in excessive amounts, poor adherence to the Mediterranean or healthy dietary standards, and low culinary skills. The school canteen is not seen as a place for non-formal learning, especially regarding food, to avoid and combat food waste, coexistence rules, and the development of positive attitudes towards new foods and flavours. Inadequate eating habits and times, with a misconception of the school community about school lunch become a particularly challenging issue, linked with inadequate practices to promote ingestion by operational assistants accompanying lunch. Moreover, in 75% of these schools, teachers did not have lunch with their students, leaving them without a

reference adult at the time of the school meal. The perception of parents and guardians regarding school meals is different from that of professionals and coaches who accompany the children at school's mealtime. Myths prevail over what a balanced meal should be.

The NutriEduca project aims to promote healthy eating habits in the school environment, and therefore increase food and nutrition literacy in the school community. NutriEduca Project was created in 2019 for a municipality in the North of Portugal by its education division, in collaboration with the Faculty of Nutrition and Food Sciences of Porto University. This programme intends to address several problematics encountered in the public schools of the municipality.

It is based on two key points: training and monitoring. The beneficiaries are 1,990 children at preschool and 1st grade, 150 operating assistants and 91 teachers (Nutri-School), 3,800 parents (NutriParents).

Main objectives:

- To adapt quantity and quality of the school meal service (lunch and snacks) and to implement measures for waste reduction;
- To improve food and nutrition literacy of the school community: children, parents, teachers, educators, and operational assistants;
- To increase awareness of the school community on healthy and sustainable eating

with the implementation of "meat-free Mondays".

Specific objectives:

- To support the school community in understanding why the school environment influences children's food choices;
- To improve technical, human and infrastructure resources for the school meals for a service of excellence;
- To develop and to implement good practices and technical oriented tools for catering professionals, in kitchens and school canteens, as well as certified food and nutrition education for teachers and educators;
- To implement measures to improve children's acceptance and satisfaction regarding the school meal;
- To demystify school meals by implementing "lunch day" – each parent/guardian is invited to have lunch with their kids at the school canteen upon request, and all teachers have an offered meal every day at the school canteen paid by the municipality – to incentivize them to be a model of health to their children and to improve fundamental nutrition knowledge.



Researchers from the Potsdam Institute for Climate Impact Research (PIK) assessed the consequences if the current nutrition transition, from scarce starch-based diets towards processed foods and animal products, continues – the calculations combine, for the first time, estimates for under- and overweight, food composition and waste. Their findings provide a startling look ahead: By 2050, more than 4 billion people could be overweight, 1.5 billion of them obese, while 500 million people continue to be underweight.

“If the observed nutrition transition continues, we will not achieve the United Nations goal of eradicating hunger worldwide,” explains Benjamin Bodirsky from PIK, lead author of the study just published in *Scientific Reports*. “At the same time, our future will be characterized by overweight and obesity of mind-blowing magnitude.” By 2050, 45% of the world’s population could be overweight and 16% obese – compared to about 29 and 9% in 2010. This development is due to the insufficient global distribution of food as well as to the shift from scarcely processed plant-based diets towards unbalanced, affluent diets, where animal protein, sugar and fat displace whole grains and pulses.

And that’s not all as Bodirsky underlines: “The increasing waste of food and the rising consumption of animal protein mean that the environmental impact of our agricultural system will spiral out of control. Whether greenhouse gases, nitrogen pollution or de-

forestation: we are pushing the limits of our planet – and exceed them.”

Food systems as driver for greenhouse gas emissions

Crop and grazing land for food production cover about one third of the global land area; our food system is responsible for up to a third of global greenhouse gas emissions. The study projects that – if current trends continue – global food demand will increase by about 50% between 2010 and 2050, the demand for animal products like meat and milk will approximately double, a development that requires more and more land.

“Using the same area of land, we could produce much more plant-based food for humans than animal-based food,” explains co-author Alexander Popp, head of PIK’s Land Use Management Research Group. “To put it in a very simplistic way: If more people eat more meat, there’s less plant-based food for the others – plus we need more land for food production which can lead to forests being cut down. And greenhouse gas emissions rise as a consequence of keeping more animals.”

Global food demand: distribution and education are at the heart of the problem

The study provides a first-of-its kind, consistent long-term overview of a continued global nutrition transition from 1965 to 2100, using an open-source model that forecasts how much of food demand can be attribut-

ed to factors like population growth, ageing, increasing height, growing body mass index, declining physical activity and increasing food waste. Co-author Prajal Pradhan from PIK explains: “There is enough food in the world – the problem is that the poorest people on our planet have simply not the income to purchase it. And in rich countries, people don’t feel the economic and environmental consequences of wasting food.” But redistribution alone would not be sufficient, as actually both the poor and the rich eat poorly: There is a lack of knowledge about a healthy way of life and nutrition.

How to trigger an appetite for change?

“Unhealthy diets are the world’s largest health risks,” co-author Sabine Gabrysch, head of PIK’s Research Department on Climate Resilience, explains. “While many countries in Asia and Africa currently still struggle with undernutrition and associated health problems, they are increasingly also faced with overweight, and as a consequence, with a rising burden of diabetes, cardiovascular disease and cancer,” she adds. The study could provide valuable orientation about the potential development pathway of different countries and regions. It could also support much-needed pro-active policies for a qualitative transition towards sustainable and healthy diets.

Sabine Gabrysch concludes: “We urgently need political measures to create an environment that promotes healthy eating habits. This could include binding regulations that limit the marketing of unhealthy snacks and promote sustainable and healthy meals in schools, hospitals and canteens. A stronger focus on nutrition education is also key, from early education in kindergarten to counseling by medical doctors and nurses. What we eat is of vital importance – both for our own health and that of our planet.”



Just a handful of rice – a part of our world is starved. Fast food pizza – another part of our world is stuffed, throwing away food every day. This gap is likely to worsen, while food waste will increase and pressure on the environment will go up, a new study shows. © (left) Ruggiero_S ©(right) JumlongCh



The Czech Association of Dietitians New Guidelines on the Nutrition Care Process in Geriatrics

For the first time in history, Czech dietitians have joined together with members of the medical societies to create joint guidelines on the nutrition care process for the geriatric population!

Malnutrition and dehydration are widespread in older people, and along with sarcopenia and frailty, are a growing problem in the Czech Republic. But in clinical practice, it is often unclear which strategies are suitable and effective to identify and address these key health threats.

For this reason, the Czech Association of Dietitians (CAD) initiated the formation of

a Working Group for the standardization of nutrition care in geriatrics. The goal of this working group was to provide evidence-based recommendations for clinical nutrition care and hydration in elderly people in order to prevent and/or treat malnutrition and dehydration, and standardize the nutritional screening in all facilities where geriatric patients are treated.

CAD joined together with two Czech medical societies – the Czech Gerontological & Geriatric Society and the Czech Society for Clinical Nutrition & Intensive Metabolic Care – and to date they have created two

national guidelines for nutrition care in geriatrics: General Principles of Nutrition Care and Nutrition Screening & Process. With continued collaboration from the medical societies, CAD is currently developing additional guidelines related to sarcopenia and frailty.



Irish Nutrition & Dietetic Institute New Booklet on Nutrition and Parkinson's Disease

The INDI is delighted to launch a new booklet entitled 'Eating Well with Parkinson's Disease' which has been written by INDI registered dietitians working within the Older Person's Nutrition Interest Group. The authors have also had feedback on the booklet from a number of health care professionals including Occupational Therapists, Speech and Language Therapists and also patients living with PD through the Parkinson's Association of Ireland, who were very happy to endorse the booklet.

Whilst there is no specific 'PD diet', research to date is showing that healthy diets are beneficial to people living with PD. Diet can also play a role in improving some of

the symptoms people with PD may experience such as:

- Unintentional weight loss or gain
- Chewing and swallowing difficulties
- Constipation
- Dehydration
- Osteopenia and osteoporosis



You should be referred to a Dietitian soon after your diagnosis and have ongoing reviews throughout your Parkinson's journey. Your Dietitian can assist you with maintaining a healthy weight and muscle mass, ensuring good hydration status, and reducing your risk of constipation. Your Dietitian can help you to manage dietary issues related to your PD and advise on the best diet to maximise the effect of your PD medications.



News in Kompas Nutrition & Dietetics

Dear Reader,

Please contribute news from national dietetic associations. Space permitting, we will be pleased to include your news item. For an easy handling please note:

For Kaleidoscope we use press releases. Please submit

- o an English text (not more than 2,000 characters) with a catchy **headline**
- o full **name of the institute/organization** who spread the news, its **logo** and a **web address**

Additionally, a photo, graphic or other eyecatcher could be included, as long as you hold the copyright and we can use the element for free.

For the Calendar of events please submit

- o name,
- o date,
- o location,
- o website of the event

Please send your contribution to Christine (c.schiller@karger.com) at Karger Publishers.

**Ireland Shortlisted to Host ICD 2028
Voting will open in May 2021**

Ireland has been shortlisted as one of 4 final countries in a bid to host the International Congress of Dietetics in August 2028. The voting process will be open in May and all members from ICD member countries will have a vote. We would very much welcome your support.
www.indi.ie



APRIL 2021

Online
Virtuell Classroom by the General Council of Dietitians-Nutritionists of Spain: Toma conciencia de la profesión – Becoming aware of the profession
20 April 2021
www.consejodietistasnutricionistas.com

Online
German Association of Dietitians (VDD) National Congress
22–24 April 2021
www.vdd.de/vdd-kongress-2021

MAY 2021

Online
FAITH Frailty Summer School: Frailty and resilience – Powerfully interrelated
31 May – 4 June 2021
www.faithresearch.nl/faithacademy

JUNE 2021

Online
Nutrition 2021 – Ernährung 2021: Ernährung – Evidenz gefunden?
24–26 June 2021
<https://nutrition2021.ch>

JULY 2021

Classroom by the British Association of Dietetics: Consolidating Dietetic Practice in Diabetes
6 July 2021
Birmingham, UK
www.bda.uk.com/ems-event-calendar/consolidating-dietetic-practice-in-diabetes0721.html

AUGUST 2021

Online
8th International Conference on Nutrition and Growth (N&G 2021)
26–28 August 2021
<https://nutrition-growth.kenes.com/scientific-program>

SEPTEMBER 2021

Classroom by the British Association of Dietetics: Starting out as a Freelance Dietitian
30 September 2021
Birmingham, UK
www.bda.uk.com/ems-event-calendar/starting-out-as-a-freelance-dietitiansept21.html

OCTOBER 2021

Hybrid
18th UPDLF Study Day: Is there a connection between nutrition and exercise therapy? How to maximize nutritional care efficiency?
1 October 2021
Charleroi, Belgium + Online
<https://journeedetude.lesdieteticiens.be>

Online
III Foro de Alimentación Responsable
14–15 October 2021
www.alimentarbien.com

13th EFAD Congress of Dietetics
22–23 October 2021
Budapest, Hungary
efadconference.com