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ANOREXIA OF AGING - AN UPDATED SHORT REVIEW

A.D. JADCZAK[1,2], R. VISVANATHAN[1,2,3]

1. National Health and Medical Research Council Centre of Research Excellence Frailty and Healthy Aging, University of Adelaide, South Australia, Australia; 2. Adelaide Geriatrics Training and Research with Aged Care (G-TRAC) Centre, Adelaide Medical School, University of Adelaide, South Australia, Australia; 3. Aged and Extended Care Services, The Queen Elizabeth Hospital, Central Adelaide Local Health Network, Adelaide, South Australia, Australia. Corresponding author: Agathe Daria Jadczak, University of Adelaide, South Australia, Australia, agathedaria.jadczak@adelaide.edu.au

Abstract: The anorexia of aging affects approximately a quarter of older people and is a major contributor to the development of under-nutrition and many other adverse health outcomes in older people. Despite the high prevalence, the anorexia of aging is frequently overlooked by clinicians and, of even more concern, it is commonly accepted as inevitable and a part of 'normal' aging. Early identification of risk coupled with efforts to mitigate these risks through appropriate interventions might stem the deleterious consequences of the anorexia of aging. This review aims to provide an update on the current knowledge base whilst making some practical suggestions that may be of use in clinical practice. Interventions such as exercise and good nutrition remain the preferred treatment while pharmacological options, whilst they continue to be trialed, are not currently recommended for routine clinical use.

Key words: Anorexia, aging, weight loss, malnutrition.

Introduction

With population aging manifesting globally and the absolute numbers of people aged 65 years and older increasing rapidly, preventable health conditions common to older people warrant attention (1). One such geriatric syndrome is under-nutrition and its precursor, the anorexia of aging (2).

The anorexia of aging includes a loss of appetite and/or reduced food intake which can be noticed with older age. It is associated with the development of under-nutrition and other adverse health outcomes (3), such as poor quality of life, morbidity and mortality (4). Anorexia and the associated reduced food consumption culminates in a failure to meet energy and nutrients requirements (5), which in turn leads to unintentional weight loss, muscle mass loss (sarcopenia), functional decline and the loss of independence (6).

To an older person, the loss of their independence is highly significant and therefore, where prevention is possible, it should be pursued. Staying independent and maintaining a good quality of life is viewed as one of the most important goals by older people (7). Therefore, optimizing an older adult's nutritional status with the aim of optimizing their physical function and independence is an important intervention. Identifying the risk for the anorexia of aging to prevent the onset of weight loss is an important first step in any management strategy. However, where under-nutrition has set in, some of the strategies recommended for the prevention and management of the anorexia of aging would still be applicable.

The aim of this review is to provide an update on the screening, risk factors and management options related to the anorexia of aging.

Prevalence

Anorexia is common among older people, affecting approximately 25-30% of older men and women (8). The prevalence is higher in nursing homes and hospitalized older people when compared to those living in the community (8, 9), and women are more often affected than men (10). Despite the high prevalence, the anorexia of aging is frequently overlooked by clinicians and, of even more concern, it is commonly accepted as inevitable and a part of 'normal' aging, thus the opportunity for early diagnosis and treatment is frequently missed (6) resulting in detrimental consequences to the older person.

Pathophysiology and Risk Factors

The pathophysiology of the anorexia of aging in older people is multifactorial and is compounded by biological, social and environmental factors, and problems. Therefore, when attempting to intervene, both intrinsic and extrinsic factors need to be concurrently identified and remediated.

Sense of smell and taste decrease with aging and may affect the older person's desire to eat. With increasing age, there can be increases in pro-inflammatory cytokines, which in turn are associated with cachexia, excess catabolism and reduced food intake (11). Changes in the production of appetite-regulating peptides and hormones influence gastric emptying, satiety, and the feeling of satisfaction culminating in a feeling of early satiety and reduced oral intake (11). Whilst intrinsic factors involve neuro-endocrine changes, these are not discussed in detail here, but reviews have been published (12, 13).

In terms of risk factors that could be minimized to prevent the risk of under-nutrition, missing or broken teeth or poor fitting dentures, with or without poor oral health can compound the anorexia of aging to reduce oral intake (14). Psychological

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factors which include mood disorders, such as anxiety or depression (15) are further powerful inhibitors of appetite and a common reversible cause of anorexia and weight loss (6). Social factors including the social isolation of older people can also affect food intake. Eating is often a social event, although barriers of loneliness, mobility and incontinence can prevent older people participating in such occasions. Living and eating alone can cause reduced appetite, possibly due to a lack of support or motivation to shop, cook and eat well (16). Additionally, eating alone is less pleasurable and people living alone have fewer social engagements, which may negatively affect the appetite of many older people (16). Environmental and financial barriers are further factors that can cause decline in food intake among older people. Not having the money to buy food and the lack of access to shops as result of terrain or transportation barriers impedes access to good nutrition. Simply forgetting to eat as a result of the onset or progression of dementia is something that will require external support if good nutrition is to be achieved and weight loss prevented (6). Whilst medications are there to optimize health in many instances, some medications have a negative impact on appetite and nutritional intake in older people. A recent review suggests that more than 250 prescribed medications can alter either the sense of taste or smell, cause oral dryness and constipation, which all have been linked to appetite reduction (17).

Screening

A common tool to screen for anorexia is the Simplified Nutritional Assessment Questionnaire (SNAQ). The SNAQ with its good predictive weight loss for malnutrition and future weight loss is a simple screening tool (18, 19). It consists of four questions relating to appetite, satiety, taste and meal frequency (18, 20). The risk score on the SNAQ goes up to 20 and is able to predict future weight loss over a six month period with 82% sensitivity and 85% specificity in people aged 60 years and older (18). A score of less than 15 indicates a risk of future weight loss and anorexia (18). The SNAQ could be applied to healthier populations as a means of intervening earlier to prevent the onset of under-nutrition and its use is best positioned in the primary care setting.

Given the overlap of anorexia with other geriatric health conditions, such as sarcopenia and frailty and the significant impact of dementia on these health conditions, a combined screening approach might prove more effective. Such an approach makes sense, as all conditions share common risk mitigation and management strategies. The Rapid Geriatric Assessment (RGA) (21), is a process which combines the screening for four geriatric syndromes, frailty, sarcopenia, anorexia of aging and dementia. It is quick to administer and consists of the FRAIL Scale (22) for frailty, SARC-F (23) for sarcopenia, SNAQ (18) for anorexia of aging and the Rapid Cognitive Screen (24) for dementia. All of these screening tools identify risk and should lead to further assessment where risk has been identified.

Management and Interventions

There are currently three intervention strategies that are commonly discussed in the literature which are exercise, nutrition and pharmaceutical interventions (4, 6, 25). However, apart from this, other risk factors should also be managed to improve the overall wellbeing of older people experiencing the anorexia of aging as this could reduce the risk of ongoing weight loss and progression of under-nutrition (16). The responsibility to identify and manage this condition will often need to draw on the skills and knowledge of multiple healthcare practitioners (e.g. medical, nursing, allied health and pharmacy) in addition to families and consumers.

Exercise Interventions

Exercise is a key component in the treatment of anorexia in older people because this single strategy not only improves appetite and increases oral intake (6), but has other beneficial effects such as improving mood (26), and building muscle mass as well as strength thus reducing the risk of sarcopenia and frailty (27). Exercise has also been proposed as an important strategy in the treatment of dementia and the prevention of cognitive decline (28), both of which can compound the effects of the anorexia of aging (6). By reducing the risk of constipation, exercise might counteract the impact of early satiety, seen with the anorexia of aging (6). Exercise decreases pro-inflammatory cytokines whilst increasing the resting metabolic rate which could possibly contribute to a stimulation of appetite (6).

Multi-component exercises, including resistance, aerobic, balance and flexibility training, are widely used in the community (29) and the evidence demonstrates it positively influences muscle mass, strength, physical function and mobility (30, 31) which helps to maintain independence and improve quality of life (27). An optimal combination and gradual increase of intensity, duration and frequency is crucial and multi-component exercises should be performed three times per week for 45-60 minutes per session at a moderate to high intensity (30). General practitioners play an important role in promoting and prescribing exercise, in addition to other health professional such as exercise physiologists. Older people value the advice received from their general practitioners on this topic (32).

Resistance training can increase the resting metabolic rate and protein synthesis in skeletal muscle cells thus increasing muscle strength and mass (32, 33). Muscle protein synthesis leads to muscle hypertrophy (33) which addresses the loss of muscle mass, a significant problem of anorexia. Aerobic exercise on the other hand improves metabolic control, reduces oxidative stress and optimizes exercise capacity (34). It has also been shown to improve skeletal muscle insulin sensitivity,

stimulating skeletal muscle hypertrophy and increasing skeletal muscle mass (35, 36), all of considerable benefit in preventing the loss of muscle mass. The weight loss arising from the anorexia of aging could result is muscle mass loss and an increased risk of falls and fracture, which are a major threat to the independence of older people but where balance training has a major role in prevention (37). Flexibility training has been suggested as a measure to increase cadence (steps/min), walking speed (m/s), stride length, passive hip extension, and motion range, resulting in improved mobility and gait quality (38). With better mobility, the ability to purchase food and prepare meals as well as participation is social activities is enhanced, thus minimizing the impact of the anorexia of aging. With greater mobility, barriers to social participation, such as functional incontinence, can also be addressed. Group exercise promotes social interactions and has a beneficial effect on cognition and mood (6).

Nutritional Interventions

Evidence suggests that older adults require higher levels of dietary protein to counteract age-related changes in protein metabolism (39). The optimal protein intake in people aged 65 years and above has been recommended to be at least 1.0-1.2 g/kg/day (39). Higher dietary protein intake is associated with an increase in muscle mass and strength (40). For individuals diagnosed with acute or chronic diseases, the recommended dietary protein intake is even higher at 1.2-1.5g/kg/day (39). Additionally, it is suggested that an even distribution of protein intake across the day at breakfast, lunch and dinner is beneficial (41). However, this approach is not universally agreed upon as some studies have shown benefits from pulse feeding, with benefits from a high-protein meal at midday (42). It is further recommended that there is a benefit associated with protein intake soon after exercise (43). Leucine and creatine supplementation have also been investigated with some studies indicating benefits (44, 45) whilst others finding no substantial effect (44).

It is preferable that the recommended dietary intake is achieved through a natural diet. However, in older people experiencing the anorexia of aging, meeting the recommended protein requirements may be challenging given that they may not have the appetite and may feel satiated early (20). Smaller meals with a strategy of snacking throughout the day are ways of dealing with early satiety (45). For such individuals, nutritional supplementation with high protein content is an option to ensure that the necessary protein intake is achieved (20). There is a need to ensure that apart from protein intake, the appropriate caloric intake is also met (45). A recent study using cookies containing 11.5g of protein and 244 kcal as a daily supplement found that eight cookies per day could positively impact on weight and appetite in older adults affected by anorexia (46). The hearing or intraoral sounds and chewing on edentulous gums could compensate for sight, smell and taste changes in older people (46). Flavour enhancement can improve food palatability and acceptance, increase overall quality of life and also has the potential to reduce the risk of anorexia (47).

Low serum vitamin D levels (<50 mmol) are associated with reduced muscle mass, strength, and reduced bone health and therefore should be supplemented (48, 49).

Pharmaceutical Interventions

Several medications have been investigated as appetite stimulants in older adults with symptoms of anorexia, but none of them, to date, have demonstrated successful outcomes without adverse side effects and hence their routine use in clinical practice is limited (50-52).

Two of the commonly proposed appetite stimulants, megestrol acetate and dronabinol, are approved by the Food and Drug Administration (FDA) for cancer and AIDS patients (6). These drugs have demonstrated only small effects in increasing food intake (53, 54) with risks outweighing benefits in the general older patient population and are therefore not recommended (6). Drugs such as moclobemide, tetrahydrocannabinol, cholecystokinin antagonists, and cyproheptadine which are appetite-stimulating are linked to side effects, such as delirium and abdominal symptoms (4), and therefore are not in use. Although the administration of anabolic steroids (e.g., testosterone and oxandrolone) may have some useful effects, they are overwhelmed by adverse effects on the heart and liver (4). Metoclopramide tablets, given the extrapyramidal signs when used long term, has limited utility although it may reduce early satiety in some patients (25). Currently available pharmaceutical interventions are far from providing the optimum treatment for the anorexia of aging, however, new drugs are constantly under development and improved treatments may be on the horizon (55).

Conclusion

The anorexia of aging is common, however, it should not be accepted as a normal consequence of aging, but rather viewed as an opportunity for early detection to allow for prevention and management. Simple interventions, such as exercise and attention to nutritional health involving lifestyle modification, could translate into improved health status of older people. Additionally, interventions to address oral health, mental health, social isolation, and disabilities could mitigate the effects of the anorexia of aging thus reducing the risk of ongoing weight loss and progression of under-nutrition. The successful treatment of the anorexia of aging is also likely to improve the associated conditions of sarcopenia and frailty.

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