Obesity and Health in Older Adults

16

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Abstract

The focus of this chapter is on body mass index and obesity in older adults. Further, it will be discussed whether weight loss should be generally recommended for obese older adults.

Keywords

Body mass index · Obesity · Obesity paradox · Body composition · Weight loss · Nutrition

Learning Outcomes

By the end of this chapter, you will be able to:

- Understand the epidemiology of obesity in older adults.
- Know changes in body composition with ageing.
- Explain the causes of obesity in ageing.

This chapter is a component of Part II: Specialist Versus Generalist Nutritional Care in Aging. For an explanation of the grouping of chapters in this book, please see Chap. 1: 'Overview of Nutrition Care in Geriatrics and Orthogeriatrics'.

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- Report health consequences of obesity.
- Understand the obesity paradox.
- Formulate strategies how to improve health in obese older adults independent from weight loss.

16.1 Definition and Epidemiology

Overweight and obesity are characterized by abnormal or excessive body fat accumulation which has shown to increase the risk for several diseases. Usually, body mass index (BMI), a person's weight (in kilogrammes) divided by the square of his or her height (in metres), is used to identify obesity. For persons older than 18 years, the WHO defines overweight and obesity as follows: BMI equal to or more than 25 kg/m^2 is considered overweight and BMI of 30 kg/m^2 or more as obese [1]. However, appropriateness of these cut-off values for older adults has been questioned [2], and specific cut-off values (23–30 kg/m^2) for older adults have been suggested [3] and consecutively introduced, e.g. in Iceland [4].

As a global epidemic, obesity is also very prevalent in older adults and has been increasing over the past decades [5]. According to results from the US National Health and Nutrition Examination Surveys in 2014, the prevalence of obesity was 38% in man and 39% in women older than 60 years of age [6]. Similar results have been found in other Western countries as well, including the United Kingdom, Canada and Iceland [7–9].

16.2 Changes in Body Composition with Ageing

With ageing, alterations in body composition can be observed, especially loss of lean body mass, bone mass and body water and increase in fat mass. In addition, fat mass redistributes with ageing as more visceral fat accumulates in the abdominal region and amount of subcutaneous fat reduces in other regions of the body; and there is also fat accumulation in the muscle, liver and heart [10]. In consideration of these alterations in body composition, some older adults face increased health risks due to concomitant excessive fatness and decreased muscle mass, condition called sarcopenic obesity (SO, Chap. 8) [11]. Further, patients can be both overweight and malnourished at the same time, with substantial impact on patient and/or healthcare outcomes (diagnosis of overweight or obese malnutrition, DOOM) [12]. Note DOOM is different to SO. SO includes age-related sarcopenia, whereas DOOM is specifically limited to those with concurrent diagnoses of malnutrition and obesity.

16.3 Causes of Obesity

The main cause of obesity and overweight is an energy imbalance between energy intake and energy expenditure. In many populations and societies, there have been an elevated consumption of energy-dense foods containing excessive amount of fat

and sugar and a decrease in physical activity due to the predominantly sedentary nature of today's work, passive modes of transportation and increasing urbanization [13, 14]. Adverse alterations in dietary intake and decreased physical activity can be attributed to environmental and societal changes associated with sectors such as health, agriculture, transport, urban planning, environment, food processing, distribution, marketing and education [1].

As ageing is characterized by a markedly loss of muscle mass, reduced exercise and reduced basal metabolic rate with the preference of oxidizing carbohydrate instead of fat, older adults might be even more prone to develop obesity. Although caloric intake does usually not increase significantly and may actually decrease with age, this does not seem to compensate for the decline in energy expenditure, which leads to body fat accumulation and consequently to metabolic problems [15].

16.3.1 Health Consequences of Obesity

Obesity leads to unfavourable physiologic state due to changes in insulin resistance, sex hormones, growth factor milieu, increased blood lipids and the creation of various adipokines, including inflammatory cytokines, e.g. tumour necrosis factor-α and interleukin-6 [16, 17]. These serious changes in the body's physiology contribute to increased likelihood of several diseases (mentioned below) and might create an environment that favours cancer development [18].

Consequently, increased body fatness is a serious risk factor for metabolic diseases, e.g. cardiovascular diseases (mainly heart disease and stroke), diabetes and some cancers (including endometrial, breast, ovarian, prostate, liver, gallbladder, kidney and colon). The risk for these non-communicable diseases increases with increasing BMI, and at present times, overweight and obesity are associated with more deaths than underweight on a global perspective [1, 19, 20]. In addition to the metabolic consequences of obesity, excess weight plays burden to musculoskeletal system and is a major risk factor for osteoarthritis in the lower extremities. Moreover, obesity impairs physical functioning and mobility limitations, which are common among older obese people [21].

16.3.2 Obesity Paradox: Protective in Older Adults and Patient Population

Many chronic conditions may lead to weight loss among older adults, and at that time being, obese may provide additional protection. In fact, some people who are obese live actually longer than their normal weight counterparts. This phenomenon is called 'obesity paradox'. For example, patients with coronary artery disease, heart failure, type 2 diabetes and chronic kidney disease have lower mortality risks than [22, 23] or similar [24–26] to older adults in the normal weight category.

It may sound counter-intuitive that a known risk factor for several diseases actually turns protective after diagnosis of these conditions, and over the past decade, there has been an active scientific discussion about the obesity paradox proposing

evidence both for and against it [27]. Some studies emphasize the role of muscle mass [28] and cardiorespiratory fitness [29], and it appears that the obesity paradox may not apply to physically fit persons [30]. However, several factors have been identified which may explain the protective effect of excess weight. These include better nutritional reserves, better haemodynamic stability, higher bone mineral density and protection from fat around hip area in case of a fall [31–33]. In addition, several factors related to the study design and study populations may explain why lower mortality risk is observed among obese persons, including healthy survivor bias; individuals with severe illness may have lost weight recently leading to lower BMI; BMI does not necessarily represent body fat; BMI cut-offs are not being appropriate; and obese patients are diagnosed earlier [34–36].

16.4 Is Targeted Weight Loss Appropriate in Older Adults?

Weight loss among older obese has not been generally recommended, since weight loss may have harmful effects by accelerating loss of muscle mass and bone density. However, during the last decades, many weight loss intervention studies in older obese adults have been carried out, and our understanding on weight management at older ages is increasing [37–39]. These studies suggest that the combination of controlled weight loss and energy reduction, but protein-adequate diet, combined with exercise produces the most beneficial effects on weight loss, physical functioning, quality of life and reduced pain. In addition, studies have also reported positive changes in body composition, i.e. decreased weight and fat mass, and improved glycaemic control [40–42].

Although multicomponent interventions are a reasonable and appropriate method in our opinion, it is difficult to attribute positive outcomes of such studies solely to weight loss and might be even misleading. Considering that the achieved and maintained mean weight loss is usually small in such studies (around 5 kg) [41], one could argue that differences in health outcomes between intervention and control groups are likely driven by physical activity and not by minor weight loss. This assumption is supported by studies reporting beneficial changes in physical function and cardiovascular risk factors after an exercise protocol with no weight change at all [43–45].

As an example for this methodological dilemma, we want to cite a recent meta-analysis on intentional weight loss and mortality in older adults [46], in which weight loss is associated with a 15% reduced risk of mortality. However, when looking at the individual studies, it can be seen that this reduction is mainly driven by studies including exercise as part of the intervention [38–42], whereas diet-only-induced-weight loss studies showed even increased mortality in the intervention group (albeit not significant) [32–35].

It has been suggested that obese older adults who have either metabolic abnormalities, e.g. increased circulating triglycerides, or functional impairment, for example, slow gait speed, would benefit most for weight loss, under the provision that that lean body mass and bone mass can be preserved [47]. However, in real life,

it might be impossible to limit these losses, as the negative energy balance during weight loss is responsible for a catabolism which inevitably affects negatively the skeletal muscle and bone [48].

Considering the uncertainty of the benefits of intentional weight loss according to intervention studies and the overwhelming evidence from epidemiological research on the negative effects of weight loss in older adults, as well as the given difficulties to maintain weight change [49], it seems prudent *not* to focus solely on weight loss in older obese adults. This is particularly relevant where highly restrictive, self-prescribed 'fad' diets are cycled leading to both poor intake of protective nutrients and inadequate intake leading to sarcopenia. In case of targeted weight loss, it has to be carefully monitored to, as a minimum, preserve muscle strength and physical function with careful serial measurements to assess for sarcopenia and also preferably ensure a good balance of macro- and micronutrients.

The main focus among older obese adults should be in increasing physical activity by resistance and aerobic exercise to increase or maintain physical functioning, independence and good health in older adults without the uncertainties and hardship that come with energy restriction and weight loss (Chap. 14). Attention should still be placed to improve diet quality using nutrition therapy to optimize energy intake and expenditure as well as to promote healthy eating habits with adequate amount of protein and a broad variety of fresh products among older adults to avoid further weight gain and obtain benefits of the good quality of nutrition.

We think that more critical older adult's characteristics should be explored before potentially initiating a weight loss diet: motivation and attitudes, cognitive function, social environment and family support and financial restraints.

However, it should be mentioned that obesity is a frequent concern in older adults with diseases that impair mobility, e.g. stroke and arthritis. These associations between mobility impairments and disease can negatively affect older adults' willingness and ability to engage in healthy behaviours, consequently resulting in energy imbalance, weight gain and mobility disability. In order to prevent this negative loop, there is a need to find ways to optimize energy intake and expenditure. According to a recent review in this area, nutrition and weight loss studies in older adults with mobility disability are still in building stages, with a great necessity to conduct randomized controlled trials [50] in order to find the best approaches to weight loss, e.g. high-protein diet, to manage comorbidities and disease.

16.4.1 Summary

Weight loss in overweight older adults is not routinely recommended or advised [3] and, even in obese older adults, should only be carefully considered in partnership with suitably qualified health professionals. To conclude, it is important to emphasize the role of healthy weight throughout adulthood. Maintaining normal weight and preventing weight gain during midlife prevent various chronic diseases and help to maintain physical, cognitive and social functioning with advancing age.

Take-Home Points

- A life-course approach to preventing obesity should be the focus of all healthcare providers.
- Overweight older adults should not routinely try and lose weight unless advised by a medical specialist.
- Obese older adults may not necessarily benefit from dietary efforts to reduce weight.
- Any dietary efforts to reduce weight should be accompanied by appropriate physical activity and careful monitoring of muscle strength and function.
- Weight loss may be harmful in older adults, even if intentional.
- There is no place for restrictive fad diets in older persons.

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Recommended Reading

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