



Obesity is associated with significant morbidity and mortality. In older adults, obesity can exacerbate declining physical function and quality of life that often accompanies aging, and can cause frailty. The value of treatment for obesity in older adults has been under debate because of the uncertain effectiveness of obesity therapies in this population as well as the potentially harmful effects of weight loss. However, current evidence shows that weight-loss treatment improves physical function and quality of life, and also eases the medical complications associated with obesity in older adults. Therefore, moderate weight loss that minimizes muscle and bone loss is recommended for obese older adults who have functional decline or medical complications.

Key words: obesity, body mass index, metabolic syndrome, weight loss, lifestyle modification

Obesity in Older Adults

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Epidemiology

Obesity is defined as a body mass index (BMI) 30 kg/m^2 and is associated with elevated health risk as well as premature mortality. Recent data from the National Health and Nutrition Examination Survey (NHANES) indicate that approximately 32% of adults in the U.S. are obese.¹ In Canada, 20% of adults are obese.² The prevalence of obesity is increasing among older age groups in developed countries. It increased by 56% among American 60–69 year olds and 36% in >70 year olds in the years from 1991–2000.³ This rise has occurred due to an increase in the total number of older persons as well as the percentage of the older population that is obese. The prevalence of obesity in older North Americans will likely to continue to rise, challenging health care systems in the United States and Canada.⁴ In fact, obesity in long-term care facilities is an increasing problem.⁵

Risks of Obesity Mortality and Morbidity

Obesity is associated with decreased survival and increased morbidity. The relative risk of death associated with obesity is greater for younger than older adults. Elevated BMI increases absolute mortality and health risks linearly up to 75 years of age; however, the precise nature of the relationship of obesity in adults >75 years with total mortality seems to be unclear.⁶ That relationship may be underestimated as the underlying diseases induced by obesity can themselves increase the

risk of mortality, and those who are susceptible to the effects of obesity may be prematurely deceased.

Metabolic Abnormalities

According to one study, the odds ratio for developing metabolic syndrome among those who are 65 years of age compared with those who are 20–34 years of age was 5.8 in men and 4.9 in women. In addition, increased abdominal fat mass was found to be independently associated with the development of metabolic syndrome in men and women aged 70–79 years.⁷

Pulmonary Abnormalities

Obesity is associated with pulmonary function abnormalities, obstructive sleep apnea (OSA), and obesity-hypoventilation syndrome.⁸ In a 30-year follow-up study, waist circumference and waist changes were the most powerful predictors of OSA in older obese and normal-weight men.⁹

Cancer

Obesity is associated with an increased risk of several types of cancer that occur more commonly in older than in young adults, including breast, colon, gallbladder, pancreatic, renal, bladder, uterine, cervical, and prostate cancers.¹⁰

Urinary incontinence

The prevalence of urinary incontinence increases with age and affects >15–30% of persons aged 65 years.¹¹ The increase in urinary incontinence is directly associated with increased BMI.¹¹

Arthritis

The prevalence of osteoarthritis (OA) increases progressively with age and increases in body weight and fat. In one study, the relative risk of developing knee OA increased from 0.1 for a BMI lower than 20 kg/m² to 13.6 for a BMI of 36 kg/m² or higher at a mean age of 73.¹²

Physical Function and Quality of Life

Obesity increases the risk for functional decline in older persons due to the health consequences associated with carrying excess body weight, along with age-relat-

ed decreases in muscle mass and strength.⁵ These impairments affect activities of daily living and quality of life. Moreover, older obese adults (BMI 30) have a higher rate of admission to long-term care facilities than nonobese older adults (BMI: 18.5–24.9).¹³

Obesity is an important cause of frailty in older adults. In one study,⁵ 96% of community-dwelling older adults (65–80 years old) with BMI 30 were frail, determined by physical performance test scores, peak oxygen consumption, and self-reported ability to perform activities

of daily living. In another study, obesity was associated with a significant risk of frailty (odds ratio = 3.5), determined by weakness, slowness, weight loss, low physical activity, and exhaustion in women (70–79 years old).¹⁴

Benefits of Obesity

While obesity is correlated with deteriorations in health, excess body weight is associated with some protective effects as well. For example, obesity is associated with increased bone mineral density (BMD) and decreased osteoporosis and

Table 1: Recommendations for Older Adult Weight Loss Therapy

Goals

Help obese older persons set personal goals.

Consider obstacles such as impaired vision and hearing, multiple comorbidities, and limited financial resources before recommending therapeutic strategies.

Include participation by family members and care providers.

Dietary therapy

Advocate a modest energy intake (with reductions of 500–750 kcal/d) containing 1.0 g/kg high-quality protein/d and multivitamin and mineral supplements, including 1500 mg Ca and 1000 IU vitamin D/d.

Consider referral to a dietitian for appropriate nutritional counselling.

Physical activity

Aid the patient in understanding that activity is an integral part of weight loss therapy and weight maintenance.

Assess the need for exercise stress testing before participation.

Advocate an exercise program that is gradual and individualized.

Devise a multicomponent exercise program including stretching, aerobic activity, and strength exercises.

Behaviour therapy

Assess individual's motivation to implement the weight loss and management program and take steps to motivate individual for treatment.

Help develop behaviour strategies including self-monitoring, goal setting, social support, and stimulus control to achieve and maintain weight loss.

Consider referral to a behavioural therapist for appropriate counselling.

Combined therapy

Advocate a combination of an energy-deficit diet, increased physical activity, and behaviour therapy, which is associated with a lower risk of treatment-induced complications.

Pharmacotherapy

Recognize that data on pharmacotherapy are limited.

Surgery

Surgery may be an option in carefully selected individuals who meet the criteria for surgery.

Source: Adapted from Villareal DT et al., 2005.²⁵

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fractures in older men and women.¹⁵ Both the increase in BMD and the extra cushioning effect of the fat surrounding crucial areas such as the hip might provide protection against hip fracture during a fall in obese older persons.¹⁶ In addition, weight loss, body fat loss, and low BMI are associated with an increased risk of osteoporotic fracture.¹⁷

Effects of Weight Loss

Mortality

Several population studies of older, community-dwelling adults evaluated the effect of weight loss or weight cycling (repeated loss and regain of weight) on mortality, comparing the effects with maintenance of stable weight. Those who lost weight or weight cycled had an increased relative mortality risk.^{18,19} However, these studies did not determine whether the observed weight changes were intentional or unintentional, were not randomized controlled trials, and most used self-reported weight change and did not distinguish between weight loss in obese and nonobese individuals.

Body Composition

Diet-induced weight loss results in a decrease in both fat mass and fat-free mass (FFM);²⁰ therefore, there is concern that weight loss could increase sarcopenia. Adding endurance or resistance exercise training to a diet program helps preserve lean mass during weight loss and can attenuate bone loss.²¹ A random-

ized, controlled trial (RCT) found no significant difference in loss of FFM after a diet-induced weight loss plus regular exercise compared with the control group who did not lose weight in obese older adults.²² In addition, ensuring adequate dietary calcium and vitamin D intake will prevent bone loss associated with weight reduction.

Medical Complications

Long-term obesity-related multiple metabolic coronary heart disease (CHD) risk factors are reversible in older adults. A recent RCT conducted to examine the effects of lifestyle intervention (diet plus exercise) on CHD risk factors in obese older adults (aged >65 years) showed that moderate weight loss induced by lifestyle intervention decreased multiple metabolic CHD risk factors, including waist circumference, blood pressure, plasma glucose, free fatty acids, inflammatory markers, oral glucose tolerance, and insulin resistance simultaneously.²³

Physical Function and Quality of Life

Moderate weight loss plus physical activity improves physical function and health-related quality of life in obese older persons. The combination of moderate diet-induced weight loss and exercise therapy has been found to improve both subjective and objective measures of physical function and health-related quality of life, and has a

greater benefit than either exercise or diet interventions alone in overweight.²² These findings indicate that obesity is a remediable cause of frailty and impaired quality of life in older adults. In addition, these results refute the notion that it is difficult to achieve successful weight loss in older persons because of ingrained, life-long diet and activity habits.

Treatment Options

Preventing and treating the medical complications of obesity may be the most important reason for treatment in young and middle-aged adults, but improving physical function and quality of life may be the most important reason in older adults. The current therapeutic tools available for weight loss and management are presented below, and recommendations for weight loss therapy in this age group are featured in Table 1.

Lifestyle Intervention

Lifestyle modification is as effective in older adults as in younger persons.²² The combination of an energy-deficit diet, increased physical activity, and behaviour modification can cause moderate weight loss and is associated with a lower risk of treatment-induced complications. Exercise should be introduced early in the treatment course. Endurance and resistance exercises improve physical function and can ameliorate frailty in older adults.²⁴

Key Points

Obesity is associated with significant morbidity and mortality.

The prevalence of obesity is increasing among older age groups in developed countries.

Studies have found obesity to be an important cause of frailty in older adults, as determined by physical performance test scores, peak oxygen consumption, and self-reported ability to perform activities of daily living.

Among overweight older adults, the combination of moderate diet-induced weight loss and exercise therapy has been found to improve both subjective and objective measures of physical function and health-related quality of life and had a greater benefit than either exercise or diet interventions alone.

Lifestyle modification is as effective in older as in younger persons.

Therapeutic approaches should seek to minimize adverse effects of weight loss on muscle and bone mass.

Pharmacotherapy

Since a small number of older adults have been included in clinical trials that evaluated the use of pharmacotherapy for obesity, the available evidence is insufficient to determine the efficacy and safety of pharmacotherapy in older persons.

Many obese older adults are already taking several medications for other diseases, which would increase the likelihood of nonadherence or errors with obesity pharmacotherapy. Also, the side effects associated with these agents may have more serious implications in older adults.

Surgery

The available data regarding the effectiveness and safety of bariatric surgery are derived from trials conducted in young and middle-aged adults. The safety and efficacy of these procedures have not been compared in randomized trials in older subjects.

Conclusion

The prevalence of obese older adults has risen rapidly. Obesity has important functional implications in older adults because it exacerbates the age-related decline in physical function and quality of life, and is significantly associated with frailty and sarcopenia. Treatment should include weight-loss therapy to improve physical function and to prevent or improve the medical complications. Therapeutic approaches should minimize adverse effects of weight loss on muscle and bone mass.



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