Calorie Restriction in Overweight Seniors: Do Benefits Exceed Potential Risks?

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Knowledge that will change your world
Preface

“Appropriate clinical approaches to obesity in older persons is controversial because of:

• the reduction in relative health risks associated with increasing body mass index (BMI) in older adults,

• the uncertain effectiveness of obesity treatment in this group, and

• the potential harmful effects of weight loss on muscle and bone mass.”

http://ajcn.nutrition.org/content/82/5/923.long#ref-15
Preface

• “The overall safety of weight loss interventions for patients aged 65 and older remains controversial.

• Although older participants tend to respond well to comprehensive behavioral weight loss treatments, and they experience the same improvements in CVD risk factors as do middle-age participants, the effect of weight loss treatment on risk of CVD, longevity, and osteoporosis has not been extensively studied.

• More studies on the health consequences of weight loss treatment with this age group are needed.”

2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults
http://circ.ahajournals.org/content/suppl/2013/11/07/01.cir.0000437739.71477.ee.DC1.html
12/8/2014
Outline

• Demographic and Health Status Overview of Older Adults
• Prevalence of Obesity among Adults Aged 65+
• Changes in Body Weight and Body Composition with Aging
• Risks and Benefits of Obesity in Old Age
• Evidence Regarding Caloric Restriction in Overweight Seniors
Number of Older Americans

Population age 65 and over and age 85 and over, selected years 1900–2010 and projected 2020–2050

NOTE: These projections are based on Census 2000 and are not consistent with the 2010 Census results. Projections based on the 2010 Census will be released in late 2012.

Reference population: These data refer to the resident population.

Life Expectancy

Life expectancy at ages 65 and 85, by sex, selected years 1900–2009

Years of life

Women, at age 65

Men, at age 65

Women, at age 85

Men, at age 85

NOTE: The life expectancies (LEs) for decennial years 1910 to 1990 are based on decennial census data and deaths for a 3-year period around the census year. The LEs for decennial year 1900 are based on deaths from 1900 to 1902. LEs for years prior to 1930 are based on the death registration area only. The death registration area increased from 10 states and the District of Columbia in 1900 to the coterminus United States in 1933. LEs for 2000–2006 are based on a newly revised methodology that uses vital statistics death rates for ages under 86 and modeled probabilities of death for ages 66 to 100 based on blended vital statistics and Medicare probabilities of dying and may differ from figures previously published.

Reference population: These data refer to the resident population.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System.
Chronic Health Conditions

Percentage of people age 65 and over who reported having selected chronic health conditions, by sex, 2009–2010

All of these are associated with obesity.

NOTE: Data are based on a 2-year average from 2009–2010.
Reference population: These data refer to the civilian noninstitutionalized population.
SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey.
Percentage of Medicare enrollees age 65 and over who are unable to perform certain physical functions, by sex, 1991 and 2009

NOTE: Rates for 1991 are age-adjusted to the 2009 population.
Reference population: These data refer to Medicare enrollees.
SOURCE: Centers for Medicare and Medicaid Services, Medicare Current Beneficiary Survey.


Changes with Body Composition

We gain weight and fat as we age.

Changes with Body Composition: Fat Deposition

- Greater relative increase in intraabdominal fat than in subcutaneous or total body fat
- Greater relative decrease in peripheral than in central FFM because of the loss of skeletal muscle

Changes with Body Composition: Loss of Height

- Compression of vertebral bodies and
- Kyphosis (posterior convex angulation of the spine)


http://medical-dictionary.thefreedictionary.com/Osteoporosis
Changes with Body Composition: Implications for Defining Obesity in Older Adults

• Obesity is now classified as a disease by the American Medical Association.

• Obesity is defined as “an excess of body fat. It may be of either total body fat or a particular depot of body fat.”

Changes with Body Composition: Implications for Defining Obesity in Older Adults

• Reliance upon Body Mass Index (BMI) as an indicator of obesity or fatness is problematic, especially in older adults:

  – changes in body composition underestimate fatness

  – loss of height overestimate fatness
Overweight and Mortality Risk

Older persons who are overweight may have a lower risk of mortality than normal weight older adults.

Unanticipated weight loss may be a sign of underlying illness and is associated with frailty.
Obesity and Survival

• Many studies have shown a decreased association with obesity and mortality among older adults.
  • Extra weight may be protective during illness.
  • Obese persons may have died at earlier ages.
  • There is a balance of risks across the life course.
  • Methodology and confounding may play a role.
• These findings are not without scientific and political controversy.


Most studies are not conducted in older populations.

Evidence for risks in older adults is either mixed, weak, or nonexistent for many diseases (see, e.g., Canning, et al., Relationship Between Obesity and Obesity-Related Morbidities Weakens With Aging, *J Gerontol A Biol Sci Med Sci* (2013)).

All comorbid conditions increase with age; harmful effects of obesity may have occurred earlier.
Declines in muscle mass and strength may lead to:

- declines in physical function—especially mobility;
- increased risk of sarcopenic obesity—with increased risk of need for long term care; and
- increased risk of frailty—especially exhaustion, fatigue, vitality.

Obesity may impact quality of life in older adults as it restricts activities.
Obesity and Health Benefits

• ↑ Bone mineral density
• ↓ Osteoporosis
• ↓ Hip fracture

Goals of Obesity Treatment for Older Adults

“Preventing and treating the medical complications of obesity may be the most important goal of therapy in young and middle-aged adults, whereas improving physical function and quality of life may be the most important goals of therapy in older adults.”

Goals of Obesity Treatment for Older Adults

“In addition, the therapeutic approach may differ between younger and older adults, because of the increased importance of preventing loss of muscle and bone mass that occurs with weight loss in older persons.”

Beneficial Effects of Intentional Weight Loss

- Improved physical function
- Reduced systemic markers of inflammation
- Improvement in cardiometabolic disease
Effects of a Lifestyle Intervention

Villareal et al., NEJM 2011; Villareal et al., Int J of Obesity, 2013.
Worrisome Effects of Intentional Weight Loss

- Mortality
- Decrease in fat mass and lean mass
- Decrease in bone mineral density and bone quality
Effects of Lifestyle Interventions

Villareal et al., J Bone Miner Res. 2012

Beavers et al., Osteoarthritis Cartilage. 2014
Lifestyle Intervention Evidence

- Healthy weight loss in this age group can be achieved through lifestyle interventions of up to a one-year period.
- Most interventions report a loss of lean body mass and bone mineral density with weight loss.
- Paradoxically muscle quality and physical function improved.
- Inflammatory molecules and metabolic markers also improved.
- Although, the independent and additive effects of exercise and weight loss on these pathways are poorly understood.

RCTs Have Demonstrated an Effect on Quality of Life with Lifestyle Intervention

• SF36 **Physical** Health Related Quality of Life, but **not Mental** Component improved
  
  
  

• Long-term differences observed, but Quality of Life decreased for both arms.

Effects of Weight Loss, Exercise, or Both on IWQOL

• Diet, exercise, and diet-exercise group all did better than control.

• Scores in the diet-exercise group improved more than in diet group, but not more than in exercise group.

• Weight and strength changes associate with IWQOL changes.

Look AHEAD Lifestyle Intervention and Improvements in Social Outcomes

• Participants in the Intensive Lifestyle Intervention compared with Diabetes Self Education more likely to have reductions in body image dissatisfaction.

• Women in Intensive Lifestyle Intervention compared with Diabetes Self Education more likely to:
  – Remain sexually active
  – Experience remission of female sexual dysfunction
Depression, Obesity, Lifestyle Interventions

- Secondary analysis of the Look AHEAD study found that of those who received the behavioral weight loss treatment, 6.3% of patients who were non-depressed at baseline (BDI <10) had clinically significant depression symptoms at 1-yr follow-up (BDI>10) and 60.8% of those with clinically significant depression symptoms at baseline were not depressed at 1-yr follow-up.
  - Only 7.8% had BDI > 10 at baseline
  - Change in depression status between baseline and follow-up was significantly associated with concurrent change in weight

Depression, Obesity, Lifestyle Interventions

• No Changes observed in the Geriatric Depression Scale in Villareal’s Weight Loss, Exercise, or Both Study.

Major Concern: Weight Cycling

- Weight regain does occur in older adults following weight loss intervention (Look AHEAD, Obesity 2014).

- Fat mass is regained to a greater degree than is lean mass in those who do experience weight regain (Beavers et al., AJCN 2011) and is associated with worse cardiometabolic risk (Beavers et al., J Gerontol, 2013).

- Weight cycling is associated with increased risk of disability and mortality in CHS study (Arnold et al., J Gerontol 2010).
Calorie Restriction in Overweight SeniorS: Response of Older Adults to a Dieting Study: The CROSSROADS Randomized Controlled Clinical Trial

• To compare the effects of a change in diet composition alone or combined with weight loss with an exercise only control intervention on:
  – body composition, namely visceral adipose tissue,
  – cardiometabolic disease risk, and
  – functional status and quality of life.

• (Co-PIs: Ard J and Locher JL, NIA R01 AG033094)
Future Research Is Needed

• Address the loss of bone and lean body mass

• Address inflammatory mechanisms

• Include sufficient follow-up to assess long-term weight maintenance and health outcomes

Additional Research Priorities

• Which obese older people should be selected for weight reduction?
• What program of prudent diet, behavior modification, and/or exercise is appropriate for which audience?
• What degree of weight loss is appropriate for which audience?
• Are there better approaches to preservation of muscle and bone mineral density during weight reduction?
• For whom is an emphasis on strength and flexibility rather than weight loss the best option?
• Can benefits of weight reduction be maintained in aging subjects?
• Are there anti-inflammatory, resistance training, hormonal, nutritional, or other interventions that may be helpful in preventing or treating sarcopenic obesity?
• Should priority for obese older persons be on diet quality, protein, and micronutrients?

In overweight/obese older adults, does long-term intentional weight loss:
- affect cognitive abilities or dementia onset?
- affect fracture risk?
- prevent physical disability?
- affect the case-fatality rate in those with chronic diseases or undergoing acute illness?
- Improve mood and lead to a better quality of life?

Is it helpful to mitigate other body composition changes?

Among regainers, would it have been better to have never lost at all?

Are there specific sub-groups that would have markedly different risk:benefit ratios?
Summary

• Many older adults are overweight or obese.
• Older adults are different from young and middle-aged adults.
• There are risks and benefits to weight loss in older adults.
• Weight loss treatment in older adults must be sensitive to unique characteristics of older adults.
• The evidence regarding intentional weight loss in older adults is not unequivocal.
Useful References


Thank You.

Questions?