Management of the severely obese patients: diet, lifestyle, behavioral modification and non-surgical treatments

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Non Surgical Interventions in Severely Obese Patients

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Ethical dilemmas

Bioethical principles

Application of bioethical principles to “Nutrition at the end-of-life”

The decision-making process
Learning Objectives

• Definition of obesity grades
• Epidemiology of severe obesity
• Goals of therapy
• Weight reduction interventions
  – Nutritional
  – Lifestyle
  – Medication
• Importance of weight-maintenance programs
World Health Organization (WHO) Classification

- **Grade 1** overweight (commonly called overweight) - BMI of 25-29.9 kg/m²
- **Grade 2** overweight (commonly called obesity) - BMI of 30-39.9 kg/m²
- **Grade 3** overweight (commonly called severe or morbid obesity) - BMI ≥40 kg/m²
• Grade 3 further subdivides in the bariatric literature to:
  – morbid obesity - BMI of 40-50 kg/m2
  – super obesity  - BMI > 50 kg/m2
Comorbidities

- Severe obesity causes twice the rate of morbidity and mortality than does moderate obesity.

- For severe obesity (BMI $\geq 40$), life expectancy is reduced by as much as 20 years in men and by about 5 years in women.
Other aspects of obesity have been associated with comorbidity:

- Fat distribution; abdominal obesity strongly correlates with the metabolic and clinical consequences of obesity

- Waist circumference

- Age of obesity onset; independently of adult BMI, an elevated BMI during adolescence is strongly associated comorbidity
Trend in obesity prevalence among adults
Health Survey for England 1993-2012 (3-year average)

http://www.hscic.gov.uk/catalogue/PUB13219
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Goals of therapy

• The aim of treating obesity is to reduce morbidity and mortality.

• Obesity is a chronic disease.

• Therefore the main aim of the therapy is lifelong maintenance of a more “healthy” body weight.

• Even though weight may remain above the normal range.
Goals

• In people with class I and class II obesity weight loss of 5%-10% is associated with a significant improvement in health
  – diabetes type II
  – metabolic syndrome
  – cardiovascular risks
  – psychosocial difficulties

• Guidelines by the American College of Cardiology (ACC), the American Heart Association (AHA), and The Obesity Society (TOS) in 2013, states that clinically meaningful health improvements can even be seen with weight loss in the range of 2%-5%. 
• Severely obese patients require a larger weight loss to achieve the same objectives.

• A precise definition of the desirable weight loss is currently unknown.
• Study on severely obese patients (BMI 52.7 kg/m²): a significant improvement in metabolic blood markers and blood pressure with an average weight loss of 38.2% (percent of their initial weight) (1).

• Data from patients who underwent bariatric surgery, with an average weight loss of ≥ 20% showed substantial improvement of most comorbid conditions (2).

(1)Anderson JW Maggard MA Ann Intern Med 2005
(2)Am J Clin Nutr 2007
• On the evidence available, a weight reduction of 10-20% should be the goal of therapy in severely obese persons.
Treatment Modalities

- Diets
- Exercise
- Behaviour
- Anti obesity medication
- Endoscopic bariatric procedures
- Bariatric surgery
General approach Lifestyle modifications

- Life-long modification in lifestyle is required for success.

- Effective management must be based on a partnership between a highly motivated patient and a committed team.

- Multidisciplinary programs have been shown to produce and sustain modest weight loss between 5% and 10% for the long-term.
Diets

- The cornerstone of dietary prescription is a long-term reduction in total energy intake.
- Achieving a *caloric deficit* is still the most important component in achieving sustained weight loss.
  - Energy expenditure is related to lean body mass.
  - Reduction in LBM is common.
  - Therefore, weight loss tends to reduce energy expenditure.
Diets are defined as:

- Low-calorie diets LCDs (1000-1500 kcal/d)
- Very-low-calorie diets VLCDs (≤800 kcal/d)
- Diet with different macronutrient compositions
Low-calorie diets (LCDs)

• Reducing daily caloric intake by 500-1000 kcal/day, to a level of 800-1800 kcal/day.
• The optimal division of calories between the macronutrients is uncertain.
• Standard recommendations: provision of ≥55% of kcal from carbohydrates, ≤ 30% from fats (8% to 10% from saturated fatty acids) and approximately 15% from proteins.

• Adequate micronutrients and macronutrients based on the RDAs.
• Mean weight loss of 0.4-0.5 kg per week.
Protein intake in LCD

• Maintaining an intake of protein with a high biologic value of 1-1.5 g/kg of adjusted body weight (not to exceed 100 g/day).

• Adjusted body weight = ideal body weight + one quarter of the excess weight.

• It is vital to preserve lean body mass.

• Reducing intake to less than 1200 kcal/day while keeping the percentage protein at 15% may lead to protein malnutrition and significant muscle mass loss.
Very-low-calorie diets (VLCDs)

- Diets providing less than 800 kcal/d.
- Typically contain high amounts of protein (70 to 100 g/d), up to 80 g carbohydrate/d and 15 g fat/d.
- Includes 100% of the recommended daily allowance of essential vitamins and minerals.
- At least 2 L/d of non-caloric fluids are prescribed.
- VLCDs are prescribed for limited periods (12-16 weeks).
- An additional period (12-14 weeks) of gradual increase in calories.
Side effects of VLCLDs

- Dizziness (35%)
- Constipation (33%),
- Fatigue/weakness (20%),
- Nausea (13%),
- Abdominal discomfort (10%),
- Diarrhea (9%),
- Headaches (6%),
- Transient increment of serum uric acid (10%)
- Elevated hepatocellular enzymes (39%)
Side effects of VLCLDs

• A high risk of gallstone formation (12-25% of patients), requiring cholecystectomy in 25%-50%, has been reported in early studies.

• Ursodeoxycholic acid administration may decrease this occurrence

• Serious adverse effects including death occurred in the 1970s when products were based on low-quality proteins (hydrolyzed collagen) and did not contained vitamins and minerals.
Use special caution

- Children
- Adolescents
- Elderly patients
VLCDs are Contraindicated:

• Pregnancy
• Protein-wasting states
• Chronic disease
• VLCDs have little or no utility in long-term weight management.

• Probably best used as gap measures before bariatric surgery or a long-term comprehensive weight-loss program in patients with very severe or morbid obesity and associated comorbidities (body mass index [BMI] ≥50).
Mixed Partial Meal Replacement

- conventional foods + liquid diets and meal bars, used as partial replacement of meals (1-2/d) and as snacks (2/d).
- A significantly greater weight loss, at one year, in those receiving the meal replacement programs compared to isocaloric conventional diet.

- Heymsfield SB Int J Obes 2003;27:537-49
Diets with different macronutrient compositions

• Low carbohydrate diets

• Low glycaemic index diet

• Low fat diet
Low carbohydrate diets

- Atkins diet - the most popular
  - A high-protein and/or high-fat, very-low-carbohydrate diet that induces ketosis.
  - Ketone bodies generated when daily dietary carbohydrate intake is under 50 g, and diuresis is forced, causing most of the short-term weight loss.
Is it better than other diets?


Low glycaemic index diet

• Encourage increased fiber intake.

• Modest reduction in the glycemic index + a modest increase in protein content may help in maintenance of weight loss.

Mediterranean diet

• Moderate-fat, restricted-calories.
• Rich in vegetables.
• Low in red meat, with poultry and fish replacing beef and lamb.
• Restricted energy intake to 1500 kcal per day for women and 1800 kcal per day for men, with a goal of no more than 35% of calories from fat.
• The main sources of added fat: olive oil and nuts.
Low fat diet

- Less than 30% of energy from fat.
- No advantage over low calorie diet.
Comparison of the Atkins, Ornish, Weight Watchers, and Zone Diets for Weight Loss and Heart Disease Risk Reduction: A Randomized Trial

All 4 diets resulted in modest statistically significant weight loss at 1 year, with no statistically significant differences between diets ($P = .40$).

• The higher discontinuation rates for the Atkins and Ornish diet groups.

• **Adherence level** rather than diet type was the key determinant of clinical benefits.

Exercise

- Exercise for at least 300 minutes a week is associated with significant weight reduction and longer maintenance of the weight loss.
- Exercise may reduce muscle related weight loss from 27% to 13% of the diet-induced weight loss.
- Aerobic isotonic exercise is of the greatest value.
- Anaerobic isometric exercise, including resistance training, can be cautiously added.
Effects of diet and physical activity interventions in severely obese

Behaviour

- Provides a structure that facilitates the meeting of goals for energy intake and expenditure
- Self-monitoring
- Goal setting
- Cognitive strategies
- Social support
Drugs

- Orlistat
- Lorcaserin
- Phentermine and topiramate combination
• **Orlistat**
  - inhibits the action of pancreatic lipase.
  - Sustained weight loss of 5-10% over 2 years.

• **Lorcaserin**
  - promote satiety by selectively activating 5-HT2C receptors in the hypothalamus.
  - more effective than diet and exercise alone at helping patients lose 5% or more of their body weight after 1 year.
  - the most serious SE: memory, attention, or language problems and aortic or mitral valve regurgitation on echocardiogram.
  - Approved in the US but not in Europe due to safety concerns.
Phentermine and Topiramate Combination

- **Phentermine** is a sympathomimetic amine, is the most commonly used weight-loss medication.
- **Topiramate**, an anti epileptic and anti migraine agent was shown to induce weight loss, but with significant side effects.
- The combination of the two in low doses may reduce side effects and achieve better weight loss.
- The most common serious harms of phentermine-topiramate were metabolic acidosis and memory, attention, or language problems.
- Approved in the US but not in Europe due to safety concerns.
Phentermine and Topiramate

Aronne LJ Obesity (Silver Spring). 2013 Nov;21(11):2163-71
Maintenance programmes

- Obesity is considered a chronic disease with a strong tendency to relapse.
- Maintenance of weight loss depends upon a lifelong programme of behavioural change.
- Partial weight regain after the period of active weight loss is the rule.
- Structured programmes for severely obese patients (diet prescription, exercise and behavioral program) are crucial for long term success.
Four-Year Weight Losses in the Look AHEAD Study: Factors Associated with Long-Term Success

- A total of 5145 overweight/obese with type 2 diabetes were randomly assigned to an intensive lifestyle intervention (ILI) or a usual care group, referred to as Diabetes Support and Education (DSE).
- Individual participants were given a goal of losing $\geq 10\%$
- During the first 6 months, participants were provided group sessions for the first 3 weeks of each month. The fourth week, they had an individual meeting with their interventionist.

Wadden TA et al. Obesity 2011
• During months 7–12, participants continued to have a monthly individual meeting + 2 monthly group sessions.

• Participants’ calorie goals the first year ranged from 1200–1800 kcal/day, depending on initial body weight.

• During the first 4 months, the dietary intervention included meal replacements and structured meal plans

Wadden TA et al. Obesity 2011
• Participants’ activity goal was ≥ 175 minutes/week of moderately vigorous physical activity, to be achieved by month 6, with a further increase for participants who met this goal.

Wadden TA et al. Obesity 2011
• Year 2-4: Each month, participants had an individual, on-site meeting (20–30 minutes), with a second individual contact, by telephone or e-mail, approximately 2 weeks later.
• Participants had individualized calorie goals
• All participants were encouraged to replace one meal or snack per day with liquid shakes or meal bars.
• They also were instructed to continue to exercise at least 175 minutes/week.

Wadden TA et al. Obesity 2011
Wadden TA et al. Obesity 2011
ILI Participants Who Lost ≥ 10% at Year 1 (N = 887)

Wadden TA et al. Obesity 2011
Weight-Loss Maintenance

• Caloric restriction
• Self-monitoring of weight
• Daily physical activity
• Minimal sedentary “screen time”
• Program attendance

(more important than any specific composition of dietary macronutrient)
Conclusions

• The results of the conventional therapy of severely obese patients are currently discouraging.
• Therefore bariatric surgery is considered the only effective therapy in the majority of patients.
• The increasing prevalence of class III obesity, and the limited access to bariatric surgery present a challenge to improve the results of conventional therapy.