Treatment of obesity

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“We are a 50+ couple. I have type 2 diabetes, asthma and mild depression. My husband has hypertension, gout, reflux disease and elevated glucose values.

We have decided to start weight loss together. Should we go to a medical check up or is it safe to start on our own?

Married couple

Hypertension, gout, reflux, glucose
- 177 cm, 112.4 kg, BMI 35.6
- Waist 118 cm
- Losartani+ 100/25 mg 1x1
- OGTT: diabetes: IP-gluk 7.5, 2h-gluk 11.3
- HbA1c 6.9
- Chol 5.1, HDL 1.0, TG 1.6, LDL 3.8
- RR 132/84
- ALAT 112
- TSH 2.4

Type 2 DM, asthma ja mild depression
- 161 cm, 88.4 kg, BMI 34.1
- Waist 102 cm
- Metformin 1+2 g, Seretide 50/100 ug/dos 1x2, Cipramil 10 mg x 1
- HbA1c 7.1
- Chol 4.2, HDL 1.0, TG 1.6, LDL 2.7
- RR 138/82
- ALAT 92
- TSH 4.2, T4v 11
2.3.2013

Clustering of risk factors

Abdominal obesity
Glucose intolerance
Dyslipidemia
Hypertension
Fatty liver
Inflammation
Thrombosis
Endothelial dysfunction
Cardiovascular diseases

Lowering of diabetes risk with weight loss

Diabetes risk, OR at 4 y

Weight loss, 1 y

Noise Diabetes Prevention Study
Jaakko Tuomilehto

Treatment of obesity

BMI ≥ 40 kg/m²
Or BMI ≥ 35 kg/m² + co-morbidity

BMI ≥ 30 kg/m²
Or BMI ≥ 27 kg/m² + co-morbidity

Surgery
Drugs
VLCD
Lifestyle

Food
Psychology
Physical activity

Sleep, time control etc

Realistic targets

Franz JAMA 2007
Concrete plan

- Weight loss goal is not a concrete plan
- Action plan: what first, what next?
- How am I going to do it in practice?
- E.g. Regular eating, what does it mean in practise?

Lifestyle counseling

<table>
<thead>
<tr>
<th>Ohjauksen sisälto</th>
<th>Keskeiset tavoitteet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological assessment</td>
<td>Needs of change</td>
</tr>
<tr>
<td>Control of eating</td>
<td>Mindful eating</td>
</tr>
<tr>
<td>Less energy but more nutrients</td>
<td>Avoiding saturated fat and quick carbs</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Everyday activity, sports</td>
</tr>
</tbody>
</table>

Psychological assessment
- Needs of change
- Barriers and things supporting the change
- Behavioural changes in practise

Control of eating
- Mindful eating
- Regular eating
- Portion size
- Avoiding empty calories

Less energy but more nutrients
- Avoiding high-energy drinks (sugar and alcohol)
- Vegetables, fruit, berries, full grain products
- Vitamins, minerals, fiber
- Avoiding crash diets, fast diets

Physical activity
- Everyday activity, sports
- Weight loss phase: moderate activity 45–60 min/d
- Weight maintenance phase: moderate activity 60–90 min/d
- To get health benefits, already 30 min/d helps

Case

- 42-year-old economist
- Non-smoker
- Family history of T2DM, hypertension, coronary disease
- 165 cm, 115 kg, BMI 42.2, waist 115 cm
- T2DM diagnosed a year ago
- Metformin 500 mg x 1
- HbA1c 8.3
- RR 150/92
- LDL 4.2, HDL 1.0, TG 3.2

Case: Food Diary

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>At home</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coffee with fat free milk</td>
</tr>
<tr>
<td>Lunch</td>
<td>At work</td>
</tr>
<tr>
<td></td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td>Coffee with fat free milk</td>
</tr>
<tr>
<td>Snack</td>
<td>At work</td>
</tr>
<tr>
<td></td>
<td>Diet coke</td>
</tr>
<tr>
<td>Dinner</td>
<td>2 slices of bread</td>
</tr>
<tr>
<td></td>
<td>Margarine, 40% fat</td>
</tr>
<tr>
<td></td>
<td>Cucumber</td>
</tr>
<tr>
<td></td>
<td>Yoghurt, 2% fat</td>
</tr>
<tr>
<td></td>
<td>Fruit quark</td>
</tr>
<tr>
<td></td>
<td>Digestive biscuit</td>
</tr>
<tr>
<td></td>
<td>Rice crisps, fat free milk</td>
</tr>
<tr>
<td></td>
<td>Ice cream</td>
</tr>
<tr>
<td></td>
<td>Chocolate sauce</td>
</tr>
</tbody>
</table>

Check from food diary
- Underreporting/eating
- Regularity of eating
- Time of eating
- Quantity
- Quality

Obese eat more than they report

<table>
<thead>
<tr>
<th>750 kcal</th>
<th>430 kcal</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 min</td>
<td></td>
</tr>
</tbody>
</table>
### Case: Nutrients

- **2424 kcal/day**
- **Protein 61 g** (10% of energy)
- **Carbohydrates 315 g** (52% of energy)
- **Fat 102 g** (38% of energy)

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### Case: After 8 Months, -8 kg, -7%

- **1560 kcal/day**
- **Protein 76 g** (20% of energy)
- **Carbohydrates 192 g** (50% of energy)
- **Fat 53 g** (30% of energy)

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**Exercise**
- **380 kcal**
- **640 kcal**
- **200 kcal**

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"I have no time to move"

- **Exercise 30 min, 3%**
- **Misc 7.5 t, 47%**
- **Work 8 t, 50%**

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**Physical Activity Prevents Loss of Lean Body Mass**

<table>
<thead>
<tr>
<th>Loss of LBM (% of weight loss)</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diet + exercise</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources:
Exercise burns visceral fat

- ½ – 1 kg/wk.
- Burn fat, don’t lose muscle and bone
- Muscle protection: Physical activity, 60-80 g protein
- Bone protection: Physical activity, Calcium
- No vitamin deficiencies

Safety

Protein, g or % of Energy?

Biological Need vs. Nutrition Calculation

<table>
<thead>
<tr>
<th>Calories/day</th>
<th>Protein (g)</th>
<th>Energy %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 kcal</td>
<td>240 kcal</td>
<td>20%</td>
</tr>
<tr>
<td>1600 kcal</td>
<td>320 kcal</td>
<td>20%</td>
</tr>
<tr>
<td>2000 kcal</td>
<td>400 kcal</td>
<td>20%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case</th>
<th>After -8 kg, -7% Intensive Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HbA1c 8.3 → 6.9</td>
</tr>
<tr>
<td></td>
<td>BP 150/92 → 135/82</td>
</tr>
<tr>
<td></td>
<td>LDL 4.2 → 2.8, HDL 1.0 → 1.1,</td>
</tr>
<tr>
<td></td>
<td>TG 3.2 → 1.5</td>
</tr>
<tr>
<td></td>
<td>CRP 11 → 3</td>
</tr>
</tbody>
</table>

100 g proteiinia

<table>
<thead>
<tr>
<th>PROT</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 g</td>
</tr>
<tr>
<td>8 g</td>
</tr>
<tr>
<td>20 g</td>
</tr>
<tr>
<td>22 g</td>
</tr>
<tr>
<td>22 g</td>
</tr>
<tr>
<td>16 g</td>
</tr>
<tr>
<td>6 g</td>
</tr>
</tbody>
</table>

100 g (850 kcal)

VLCD

- very low energy diet (VLED) or very low calorie diet (VLCD)
- energy < 800 kcal (3.4 MJ) / d
- Good quality protein 50 g
- Carbohydrates 10–80 g
- Essential fatty acids at least 3 g and
- Daily requirement of vitamins and minerals
a1  Should this line read TG 3.2-1.5?
    andreww; 31.3.2011

K1  Sorry there was something extra here, deleted
    Kirsi; 31.3.2011
2.3.2013

**VLCD**
- Contra-indications:
  - Normal weight (BMI < 25 kg/m²)
  - Severe disease (unstable angina pectoris, cerebrovascular disease, kidney- or liver disease, infection)
  - Type 1 diabetes
  - Pregnancy, lactating
  - Eating disorder
  - Psychosis
- Relative contra-indications:
  - Age under 18 or above 65
  - BMI 25–30 kg/m²
  - Gout

- Medical check before the treatment
- VLCD only
  - Vegetables
  - Protein?
  - 6–12 weeks, max 16 weeks.
  - Weight loss 1.5–2.5 kg/week.
  - Weight regain a serious problem
  - Careful follow-up plan

**Drug treatment**
- Only to patients who have motivation to change lifestyle
- Requires lifestyle treatment
- BMI >= 30 kg/m² (28 kg/m² with co-morbidities)
- Long treatment periods
- Also in the weight maintenance phase
- Orlistat the only drug available with weight loss indication as of 2/2012

**Orlistat**
- Inhibition of TG absorption 25-30%
- No absorption

**Orlistat – Weight loss**
- Placebo
- Orlistat 60 mg tid
- Orlistat 120 mg tid

**Orlistat – Prevention of Diabetes**
- Placebo - IGT -45%
- Orlistat - IGT -37%
- Placebo - All
- Orlistat - All

Rössner S, Obes Res 2000

Torgerson J, Diabetes Care 2004
Orlistat 120 mg - LDL

*P < 0.01 vs placebo.
Data pooled from 5 trials (N = 1773).

Orlistat – adverse effects (GI)

<table>
<thead>
<tr>
<th>6 kk</th>
<th>Placebo</th>
<th>60 mg x 3</th>
<th>120 mg x 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urge</td>
<td>7.9%</td>
<td>18.8%</td>
<td>23.4%</td>
</tr>
<tr>
<td>Oily stools</td>
<td>1.1%</td>
<td>17.7%</td>
<td>21.7%</td>
</tr>
<tr>
<td>Flatulence</td>
<td>1.9%</td>
<td>17.3%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Increased need for defecation</td>
<td>2.7%</td>
<td>7.1%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Faecal incontinence</td>
<td>0.8%</td>
<td>4.7%</td>
<td>7.8%</td>
</tr>
</tbody>
</table>

Mitä hyötyä orlistaatista – Painonhallinta

Liraglutide vs orlistat

Surgery

- Requirement for surgery is a careful attempt to lose weight before by conservative means
- Indications
  - BMI > 40 kg/m² or
  - > 35 kg/m² with co-morbidity (type 2 diabetes, hypertension, sleep apnea, arthritis or PCOS)
  - Age 18–60 (65) y
  - No drug addiction
  - No severe mental health issues or binging
  - The patient will have to be able to change the diet according to the requirements of the surgery
- Individual assessment

No benefits from 10 kg liposuction

2.3.2013

Surgical techniques (1 and 2 mostly used in Finland)

- Gastric bypass
- Sleeve gastrectomy
- Gastric band

Mustajoki ym. Duodecim 2009;125:2249-55

Post-bariatric nutrition

- Be aware of nutritional deficiencies, vitamin deficiencies, loss of lean body mass and bone
- Avoid "empty" calories
- Adequate intake of protein and essential fatty acids
- Lifelong supplementation (multiple vitamins, Calcium, sometimes iron)
- Careful follow-up (1, 3, 12 m, thereafter yearly)
- Käypä hoito: Lihavuuskirurgisen potilaan seuranta perusterveydenhuollossa

Complications

- Mortality 0.3–0.5 %
- Complications 13 %
- Re-operation 2–7 %.
- Most common surgical complications:
  - Pulmonary (6.1 %)
  - Bleeding (0.5 %)
  - Thrombosis (0.8 %)
  - Wound complications (1.8 %)
  - Deep infections (2.1 %)

Complications

<table>
<thead>
<tr>
<th>Side Effects (%)</th>
<th>Complications (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dumpying</td>
<td>10</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>60</td>
</tr>
<tr>
<td>Constipation</td>
<td>40</td>
</tr>
<tr>
<td>Headache</td>
<td>40</td>
</tr>
<tr>
<td>Hair loss</td>
<td>33</td>
</tr>
<tr>
<td>Depression</td>
<td>15</td>
</tr>
<tr>
<td>Anemia</td>
<td>15</td>
</tr>
</tbody>
</table>

Remission 70 %

Weather loss 20-35 %

Diabetes SOS-tutkimuksessa

Remission 35 %

Weather loss 15-30 %

No weight loss

Remission 70 %

Weather loss 20-35 %


**Summary**

- Obesity and its consequences (the 3 M's: mechanical, metabolic, mental) can be effectively treated
- Weight loss has multiple beneficial effects
- Conservative treatment = lifestyle, vlcd and drug(s), weight loss 5-10%
- Surgical treatment is only reserved to a small subgroup of most severe obesity where conservative treatment has failed, weight loss 15-30%
- Obesity treatment is team work
- Personalise care
- Check motivation, realistic targets
- Healthy weight loss
- Lose fat, save muscle and bone
- Continuous self monitoring
- Target sustainable weight loss from the very beginning

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**Hypertension, gout, reflux, glucose**

- 177 cm, 98.2 kg, BMI 31.3 = -14 kg
- Vyötärö 118->103 cm
- Losartaani+ 100/25 mg 0.5x1, metformiini 1 gx2
- Hba1c 6.9->6.2
- Kol 5.1->4.4, HDL 1.0->1.1, TG 1.6->1.3, LDL 3.8->2.8
- RR 132/84 -> 130/82
- ALAT 112 -> 80

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**Type 2 DM, asthma ja mild depression**

- 161 cm, 80.4 kg, BMI 31.0 = - 8 kg
- Metformiini 1+1 g, Flixotide 100 ug/dos 1x2, Cipramil 10 mg x 1
- HbA1c 7.1->6.5
- Kol 4.2, HDL 1.0->1.2, TG 1.6->1.5, LDL 2.7->2.5
- RR 138/82 -> 132/78
- ALAT 92 ->70

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**ENERGIANKULUTUKSEN PIENENEMINEN LAIHTUESSA**

- 95 kg 80 kg
- 2900 kcal/vrk 2400 kcal/vrk

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*www.kaypahoito.fi* → Aikuisten lihavuus

Verkkokurssi: