Effects of rapid weight loss and short-term weight loss maintenance in obese patients with cardiovascular risks and/or heart failure: a pilot study

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Background: Despite the strong association of obesity with cardiovascular disease (CVD), several studies have shown that in patients with heart failure (HF) lower BMI increases mortality. Thus the benefits of weight loss in obese patients with established CVD/heart failure could be questioned.

Materials and methods:11 obese patients with HF and/or additional CVD risks had measurements of body composition (4- compartment model), peak oxygen consumption (pVO_2), echocardiographic left ventricular ejection fraction (LVEF), and left ventricular mass (LVM) and other biomarkers: CRP, plasma norepinephrine (NE), leptin, adiponectin after 6 weeks of rapid weight loss (WL) (low energy liquid diet, 1200-1400 kcal/day) and then 12 weeks of weight loss maintenance (WLM). Data were analysed with analysis of variance and Bonferroni's multiple comparison post hoc analysis.

Results: All results mean $\pm$ SD. Baseline body weight 113.1kg $\pm$ 23.3 (range 84.2 to 148.3 kg). Total WL 10 and 12.2kg, fat WL 8.04 and 11.2 kg at week 6 and 18 respectively (ANOVA: $p< 0.0001$ for both). pVO_2 increased from 18.33 ± 4.5 to 20.96 ± 4.8 and 20.76 $\pm$ 4.8 ($p =0.0095$). There were no significant LVEF or LV mass changes. NE (435, 328.4, 318.5ng/l; $p=0.03$) and CRP (4.452, 2.992, 3.25mg/l; $p=0.0088$) fell clinically and statistically significantly (weeks 0,6, 18). Leptin fell from 52.9 to 18.2 after rapid WL, but increased to 37.5µg/l at week 18 (ANOVA: $p=0.01$). Total cholesterol (4.2, 3.5, 3.9mmol/l; $p = 0.0005$) and triglyceride (1.9, 1.2; 1. 3mmol/l $p= 0.0037$) fell, with no significant changes in HDL and LDL cholesterol. ALT fell (41, 35.8; 26.8IU/l; $p=0.0368$). No overall change in glucose or blood pressure occurred, but some patients need to reduce anti-diabetic and anti-hypertensive medication.

Conclusions: Acute weight loss was associated with improvement in several CVD risk factors without any evidence of excess loss of lean body mass or reduction in cardiac performance. These findings are reassuring that both acute weight loss and maintenance in the short term of a lower body weight is not associated with evidence of increased CVD risk – in fact the reverse was observed. These data would support the safety of conducting larger, outcome studies of therapeutic weight loss in heart failure/CVD patients.