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Effects of Short-term 3-Day Caloric Restriction on Cardiometabolic Health in Overweight and Obese Individuals

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Obesity is a major risk factor for developing cardiometabolic disease, but also characterized by impaired fat metabolism. Dietary interventions have been explored as mitigating strategies, including caloric restriction (CR), but little is known about the acute or short-term changes with caloric restriction and often such diets are not standardized. **PURPOSE:** To assess the impact of a standardized 3-day caloric restriction diet (~500kcal/d) on cardiometabolic health and fat metabolism in individuals who are overweight or obese. **METHODS:** Fifteen men and women were assessed pre-post 3-day CR using standardized commercially available diet; specifically, body weight and body composition (% body fat, visceral fat score (Vfs), Tanita RD-545), waist-hip circumferences, blood pressure and vascular stiffness (Sphygmocor Xcel), resting energy expenditure (REE) and substrate utilization (respiratory quotient, RQ) via metabolic cart (Parvomedics), and blood glucose and lipid profile (Cholestech LDX) in overweight and obese adults pre- and post-dietary intervention. **RESULTS:** The CR diet induced changes in body weight (93.1 ± 15.2 to 90.67 ± 14.4 kg, $p < 0.001$, $d = 1.9$), body mass index (32.9 ± 4.0 to 32.0 ± 3.7 kg/m², $p < 0.001$, $d = 1.4$), body fat (37.2 ± 7.5 to 35.8 ± 7.5 %, $p = 0.002$, $d = 1.1$) and Vfs (13.1 ± 4.5 to 12.2 ± 3.9 %, $p = 0.002$, $d = 1.1$), but not body water (46.3 ± 3.6 to 46.0 ± 3.6 %, $p = 0.29$, $d = 0.3$). Peripheral mean arterial pressure (86 ± 5 to 89 ± 5 mmHg, $p = 0.23$, $d = 0.3$), central mean arterial pressure (86 ± 5 to 87 ± 6 mmHg, $p = 0.44$, $d = 0.2$), and augmentation index (29.8 ± 17.5 to 21.5 ± 14.5 %, $p = 0.06$, $d = 0.6$) were unaffected. Blood glucose (86 ± 7 to 84 ± 11 mg/dl, $p = 0.33$, $d = 0.3$) and blood lipids (total cholesterol (196 ± 49 to 203 ± 54 mg/dl, $p = 0.16$, $d = 0.4$) and TC/HDL (4.9 ± 2.4 to 6.1 ± 4.7 , $p = 0.13$, $d = 0.4$)) were relatively unchanged. RQ decreased with CR (0.84 ± 0.01 to 0.76 ± 0.00 , $p < 0.001$, $d = 1.9$), indicating increased fat metabolism, though REE was unchanged (1718 ± 274 to 1722 ± 317 kcal/d, $p = 0.83$, $d = 0.1$). **CONCLUSION:** The 3-day CR significantly improved body weight and body composition, without apparent changes in body water, with improved fat metabolism, though no cardiovascular effects were noted, future studies should explore chronic intermittent use of this diet.

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