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Effects of bariatric surgery on cardiac remodeling: clinical and pathophysiologic implications

Purpose: To assess the effects of bariatric surgery (BS) on cardiac mass, volumes and function as compared to persistent morbid obesity. Although beneficial effects of weight loss on cardiac function have been reported, systematic studies on the effect of BS as compared to persistent morbid obesity are lacking.

Methods: One-hundred morbidly obese patients (body mass index [BMI] -47.7±7.7 kg/m²) referred for BS prospectively underwent an echo-cardiogram: 65 underwent BS and 35 did not. Fifty-one operated and 29 non-operated patients underwent repeat imaging after 2 years.

Results: BS resulted in a significant decrease in weight and BMI, which was accompanied by a significant reduction of left ventricular (LV) mass (from 222.9±52.2 to 207.7±50.5g) and LV end-diastolic and end-systolic volumes (LVEDV from 124.6±29.3 to 119.4±28.7 and LVEVF from 55.3±16.5 to 49.4±15.9) and by a significant increase of LV ejection fraction (from 59.9±4.8 to 59.2±4.4%). In contrast, in non-operated patients LV mass (from 226.5±71.4 to 241.4±94.7g), volumes (LVEDV from 52.8±5.1 to 54.0±6.6 and LVEVF from 32.1±3.5 to 34.9±6.9ml) significantly increased and ejection fraction deteriorated (from 57.1±5.1 to 54.7±7.4%). At multivariate analysis, BS was the only significant predictor of change in LV end-systolic volume while weight change predicted change in LV mass.

Conclusions: In extreme obesity the sustained weight loss achieved with BS is associated to an improvement of cardiac structure and function, while persistent severe obesity is associated to progressive deterioration. These favorable cardiac effects associated to previously described positive metabolic effects make BS an attractive therapeutic option in this setting of patients.

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Association of geriatric nutritional risk index and C-reactive protein with cardiovascular morbidity in end-stage renal disease patients who just began hemodialysis therapy
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Background: Protein-energy wasting (PEW), commonly observed in patients with end-stage renal disease (ESRD), is currently considered to be due to not only nutritional disorder but also inflammatory process. Recently, geriatric nutritional risk index (GNRI) has been developed as a simplified screening tool for PEW. We investigated the association of GNRI and C-reactive protein (CRP) with future cardiovascular (CV) morbidity in ESRD patients who just began hemodialysis therapy.

Methods: A total of 1548 ESRD patients who stably started HD therapy were examined. The GNRI was calculated from medical records at starting of HD, as follows: GNRI = (14.89 × albumin) + (41.7 × body weight/body weight at BMI of 22.3). Patients were divided into quartiles according to GNRI levels; quartile 1 (Q1): < 85.2, Q2: 85.2-91.2, Q3: 91.2-97.0 and Q4: > 97.0. They were also divided into quartiles according to CRP levels; quartile 1 (Q1): < 0.7mg/l, Q2: 0.7-1.8 mg/l, Q3: 1.8-6.1 mg/l and Q4: > 6.1 mg/l.

Results: Elevated CRP was independently associated with persistent morbid obesity are lacking.

Results: BS resulted in a significant decrease in weight and BMI, which was accompanied by a significant reduction of left ventricular (LV) mass (from 222.9±52.2 to 207.7±50.5g) and LV end-diastolic and end-systolic volumes (LVEDV from 124.6±29.3 to 119.4±28.7 and LVEVF from 55.3±16.5 to 49.4±15.9) and by a significant increase of LV ejection fraction (from 59.9±4.8 to 59.2±4.4%). In contrast, in non-operated patients LV mass (from 226.5±71.4 to 241.4±94.7g), volumes (LVEDV from 52.8±5.1 to 54.0±6.6 and LVEVF from 32.1±3.5 to 34.9±6.9ml) significantly increased and ejection fraction deteriorated (from 57.1±5.1 to 54.7±7.4%). At multivariate analysis, BS was the only significant predictor of change in LV end-systolic volume while weight change predicted change in LV mass.

Conclusions: In extreme obesity the sustained weight loss achieved with BS is associated to an improvement of cardiac structure and function, while persistent severe obesity is associated to progressive deterioration. These favorable cardiac effects associated to previously described positive metabolic effects make BS an attractive therapeutic option in this setting of patients.

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Adiposity and intima media thickness in adulthood. The influence of weight loss and physical activity
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Purpose: Increased adiposity has been associated with an increased cardiovascular (CV) phenotype. We examined whether exposure to adiposity has a cumulative effect on carotid intima media thickness (cIMT) and whether this effect can be modified by lifestyle modifications including weight loss and physical activity.

Methods: The study sample consisted of 1147 participants from the MRC National Survey of Health and Development (1946 British birth cohort) who underwent comprehensive vascular assessment between 60-64 years of age (mean age 63.5 years). Adiposity was characterized by body mass index (BMI) at 36, 43 and 53 years. Participants with BMI between 25-29 kg/m² were classified as overweight and those with BMI >30 kg/m² as obese at each age. Physical activity was assessed at the same ages using self-reported activity questionnaires. cIMT was measured in right and left carotid artery and mean cIMT was calculated. Values are expressed as mean (SD) in results.

Results: Obesity prevalence increased from 26% to 66% during the 27 years of follow up. Higher BMI at every age was associated with higher cIMT (p <0.001 for all). Overweight and obese individuals (group 1, N=760) had increased total cholesterol, HDLc and C-reactive protein compared to those of normal weight (group 2, N=381) (p <0.001 for all). At 63 years, group 1 had higher cIMT compared to group 2 (0.702 (0.13) vs 0.667 (0.11) mm; p <0.001). There was a graded cumulative effect of exposure to adiposity on cIMT at 63 years, with those who were overweight or obese for >20 years having higher cIMT (N=218; cIMT: 0.72 (0.14)mm) than those with 10-20 year exposure (N=166; cIMT: 0.70 (0.12) mm) and those who were normal weight throughout (N=256; cIMT: 0.67 (0.11)mm; ANOVA: p <0.001) even after adjustment for CV risk factors and recent adiposity. Subjects in group 1 were less active compared to group 2 at all ages (p <0.001), but physical activity did not modify their vascular risk. Weight reduction (a drop in category from obese to overweight or to normal) in any time period resulted in significant vascular benefit (cIMT: 0.68 (0.11)mm) for those who lost weight (N=150; cIMT: 0.68 (0.11)mm) than those with 10-20 year exposure (N=166, cIMT: 0.70 (0.12) mm) and those who were normal weight throughout (N=256, cIMT: 0.67 (0.11)mm; p <0.016 adjusted for CV risk factors) even if weight loss was not sustained.

Conclusion: Adiposity has a cumulative adverse effect on cIMT in adulthood. The vascular risk related to adiposity is not attenuated by physical activity unless this is associated with weight reduction. These data suggest that interventions addressing weight loss, even if not sustained, are likely to result in long term vascular benefit.

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Obesity paradox in asian patients with coronary artery disease after percutaneous coronary intervention

Purpose: Although, obesity is strongly associated with increased risk of cardiovascular diseases, numerous studies conducted in Western countries suggest an “obesity paradox” after percutaneous coronary intervention (PCI), whereby obese patients have better clinical outcomes compared with normal-weight patients after PCI. However, it remains unclear whether obesity paradox can be applied for Asian patients.

Methods: Within a single hospital-based cohort in the Shinken Database 2004–2010, which was comprised of all new patients (n=15227) visiting the Cardiovascular Institute, we followed patients who underwent PCI. Major adverse cardiovascular events (MACE, composite of cardiac death, non-fatal myocardial infarction, and target lesion revascularization) were assessed during a median follow-up of 45 months. Patients were classified as either obese (BMI ≥30) or of normal weight (BMI <30) at the index PCI. The cumulative incidence of MACE was compared between the two groups with the use of the Kaplan-Meier method. Differences in patient characteristics between the two groups were analyzed with the use of two-sample t tests and the chi-squared test.

Results: Among 15227 PCI procedures, 13672 patients were enrolled in the analysis. Median age was 64 years, and 60% of patients were male. The obesity paradox trend was observed in Asian patients. Obesity paradox was not observed in Western patients.

Conclusion: Our findings suggest that obesity paradox exists in Asian patients with coronary artery disease after PCI.