Heart

5.24 Obesity Increases the Effect of Sodium Intake on Left Ventricular Mass in Hypertensive Patients

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Introduction. Dietary sodium intake is involved in the pathogenesis of left ventricular hypertrophy (LVH), also independently of blood pressure. Nonetheless, it is unclear whether obesity can influence the relationship between salt intake and left ventricular mass (LVM). Obesity may influence LVM through inappropriately 'normal' aldosterone levels.

Methods. One hundred and fifty overweight-obese essential hypertensive patients (age <65 years), without kidney damage (glomerular filtration rate >55 ml/min) were studied. Anthropometric and echocardiographic parameters, plasma aldosterone, 24-hour urinary sodium (NaU) and aldosterone were collected. Patients were classified as overweight (OW, BMI 25-29.9 kg/m²), grade 1 obesity (OB, BMI 30-34.9 kg/m²), and grade 2+3 (OB+, BMI ≥35 kg/m²). LVM was indexed by body surface area or height 2.7, and LVH was defined by 2 different criteria. NaU was considered as continue or categorical [using the median (114 mEq/24h) as cut-off] variable. Logistic regression models and linear regression analysis were used to estimate the effect of 24-hour NaU on LVM, adjusting for covariates and separately for BMI classes.

Results. With each LVH definition, 24-hour NaU was a significant and independent factor of LVH. A NaU above 114 mEq/24h conferred an independent risk of LVH (OR 2.41, 95%CI1.14-5.11, p=0.022). Most importantly, the linear relationship between 24-hour NaU and indexed LVM increased with increasing BMI (LVMI: r=0.1 in OW, r=0.33 in OB, and r=0.37 in OB+, p=0.019; LVM/H^{2.7}: r=0.1 in OW, r=0.25 in OB, and r=0.35 in OB+, p<0.0001). Plasma and urinary aldosterone levels were not reduced in the patients with higher NaU.

Conclusions. Dietary sodium intake appears a significant and independent factor of LVH. The effect on LVM is increased by adiposity, most likely because plasma and urinary aldosterone levels were not adequately reduced in OW/OB patients with higher NaU.