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FATTY HEART DISEASE - MYOCARDIAL STEATOSIS IN HUMANS
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Dietary human obesity indirectly contributes to heart disease by increasing plasma lipids and predisposing to diabetes and hypertension. Recent work in a rodent model of genetic obesity has advanced the novel hypothesis that, in addition to this conventional thinking, obesity per se also constitutes a direct cause of left ventricular dysfunction by promoting myocardial steatosis, deposition of lipid droplets within cardiac myocytes. To determine if obesity also begets myocardial steatosis in humans and if this is accompanied by decreased left ventricular (LV) function, we used 1H MRS to measure lipid deposition in the LV myocardium and simultaneously measured LV geometry and systolic function using magnetic resonance imaging in 15 healthy normotensive male and female subjects who varied greatly in body mass index (BMI). The major new findings are 4-fold: (1) LV lipid concentration (measured as fat: water ratio) increased linearly with increasing BMI (r2 = 0.55, p < 0.01) and was detectable in small amounts even in very lean individuals; (2) the slope of the line relating BMI and LV lipid concentration was twice as steep in the male vs. female subjects (0.07 vs 0.03, p = 0.05); (3) LV lipid concentration predicted as much as 61% of the inter-individual variability in LV mass (r2 = 0.61, p < 0.01), whereas BMI (a standard measure of adiposity) predicted only 27% of this variability; and (4) lipid concentration in the LV septum was accompanied by a parallel decrease in septal thickening, a measure of systolic function. In conclusion, these 1H MRS data provide the first evidence for myocardial steatosis in humans and are consistent with the hypothesis that such steatosis constitutes a novel mechanism for obesity-related left ventricular hypertrophy and systolic dysfunction.

Key Words: Obesity, Renin-Angiotensin System, Cardiovascular

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THE EFFECTS OF OBESITY ON LEPTIN, INTRAERYTHROCYTE SODIUM AND C-REACTIVE PROTEIN, ON METABOLIC VARIABLES OF BRAZILIAN MALE ADOLESCENTS

To study the metabolic and cardiovascular profile in healthy obese male adolescents, comparing to lean individuals, we evaluated in 20 obese male adolescents (age 14.5 ± 2.2 yrs) and 14 lean littermates (age 15.8 ± 2.3 yrs) the anthropometrical measures (waist and hip circumferences and BMI), blood pressure (using the DINAMAP device), intraerythrocyte sodium content (NaIc) (modified Cheng's method), lipid profile, leptin, insulin (RIA), and C-reactive protein (Nephelometric method). We compared the two groups using the T-student test or Fisher's test when appropriate, and the correlations among variables were evaluated by the Pearson's and Spearman's correlation. There were no differences on age and blood pressure between groups (PAM=87.03 ± 3.1 mmHg in obese individuals vs 80.8 ± 3.9 mmHg in control group). Nevertheless we found significant differences in obese and non-obese in the following variables: leptin (17.1 ± 2.6 vs 7.457 ± 2.7 ng/dl, p < 0.01), insulin (27.4 ± 3.3 vs 14.3 ± 2.0, p < 0.007), total cholesterol (185.7 ± 2.6 vs 138.5 ± 30.1, p < 0.05), triglycerides (TG) (125.6 ± 73.5 vs 68.8 ± 28.2, p < 0.01), and NaIc (67.7 ± 2.2 vs 48.1 ± 1.7, p < 0.05). 6 obese adolescents presented values of C-reactive protein higher than 0.3 mg/dl, but no lean littermate presented such values (p = 0.03). Serum TG showed significant and positive associations to waist circumference (r = 0.37, p < 0.05), and to waist-to-hip ratio (WHR) (r = 0.44, p = 0.02). The levels of insulin were correlated significantly to leptin (r = 0.62, p < 0.0001) and NaIc (r = 0.50, p = 0.07). The NaIc showed significant correlations to waist circumference (r = 0.45, p < 0.02), WHR (r = 0.41, p = 0.02) and to BMI (r = 0.41, p < 0.04). Leptin was associated to mean blood pressure (r = 0.37, p < 0.05). Mean blood pressure was associated to waist circumference (r = 0.38, p = 0.04) and BMI (r = 0.43, p < 0.02).

In this group of adolescents, overweight and obesity are precociously associated to metabolic and endothelial derangements, which are predictors of increased cardiovascular risk.

Key Words: Obesity, Adolescents, Cardiovascular Risk Factors

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RELATIONSHIP BETWEEN OBESITY AND RESISTANT HYPERTENSION
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Resistant hypertension is estimated to affect less than 5% of the general population with hypertension, as one common contributing factor is obesity. We studied the influence of obesity on the prevalence of resistant hypertension (rHTN) among Israeli hypertensive patients. We included patients with primary hypertension from 30 general practice clinics across Israel. For each patient we recorded blood pressure (BP) levels, Body Mass Index (BMI), Lipid and Glucose levels, the presence of other coronary heart disease risk factors, the presence of target organ damage (TOD) and the treatment profile. rHTN was defined as systolic BP above 140 mm Hg or diastolic BP above 90 mm Hg (for diabetics 135 and 85 mm Hg respectively) despite treatment given at maximally recommended doses of at least 3 anti-hypertensive medications. 3828 hypertensive patients were enrolled in the study after giving an informed consent. 352 (9.2%) had rHTN. Mean BMI for the rHTN group was 31.0 ± 6.0 as compared to 28.8 ± 4.7 for the control-hypertensive group (p < 0.0001). 133 (53.0%) of the rHTN group were obese (BMI>30 kg/m2) compared to 41.4% of the hypertensive group. We found rHTN to be directly related to the BMI status (Table) and that rHTns patients were older (66 Vs. 64.7, p = 0.02), were more of the female gender (72.2%, Vs. 57.4%, p<0.0001) had a higher LDL (149±54 Vs. 133±42, p<0.0001) and had more TOD (58.9% Vs. 35.5%, p<0.0001). Logistic regression was performed to determine parameters indicative of rHTN and found BMI, female sex and age to be indicative of rHTN. In conclusion, obesity is a frequent finding among resistant hypertension patients and may play a roll in the development of resistant hypertension.

Key Words: Resistant Hypertension, Obesity, Primary Physician