The combined effect of adiposity, fat distribution and age on cardiovascular risk factors and motor disability in a cohort of obese women (aged 18-83)

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Obesity is associated with a number of serious diseases and with a degree of motor disability, but the extent of the risk and functional derangement within the obese population is not yet completely defined. The study aims to evaluate the combined effect of degree of adiposity, body fat distribution and age on selected cardiovascular risk factors and functional motor disability in a cohort of obese women. A multivariate analysis of variance (MANOVA) is employed to show the combined impact of body mass index (BMI), waist-to-hip ratio (WHR) and age on systolic and diastolic blood pressure (SBP and DBP), total and HDL cholesterol (T-CH and HDL-CH), coronary heart disease (CHD) risk, leg power output (˙W, assessed with a Margaria test for stair climbing) and subjective general fatigue in a cohort of 463 obese women (BMI range 30.2-66.7 kg/m^2; age range 18-83 yr). High WHR and older age, but not BMI, are to a variable degree related to unfavorable values of parameters which contribute to the cardiovascular risk. WHR in the high range is associated with significantly higher values of SBP (p<0.001), CHD risk scores (p<0.001) as well as lower levels of HDL-CH (p=0.01), while older age is significantly associated with higher SBP (p<0.001), T-CH (p<0.001) and CHD risk scores (p<0.001). A significant interaction between age and WHR was detected in the effect on DBP (p=0.01), the negative role of high WHR values being apparent in older women (age ≥ 51 yr) but not in younger ones (age < 51 yr). Although not significantly related to CHD risk scores, BMI interacted significantly with WHR in determining high risk score values (p=0.01), the negative effect of a high WHR being apparent in women with a high degree of obesity (BMI ≥40 kg/m^2) but not in those with a low one (BMI <40 kg/m^2). In contrast, WHR did not significantly affect ˙W, which appeared to be mainly dependent on age (p<0.001) and BMI (p<0.001), when considered in terms of unit body mass (BM). Subjective global fatigue, however, was unaffected by any of the factors considered. In the present cohort of obese women, older age and excessive abdominal fat distribution (as assessed by WHR) appear to be significant factors in relation to increased cardiovascular disease risk, irrespective of BMI, while older age and higher levels of overall adiposity are associated with functional motor de-rangement irrespective of body fat distribution. This suggests that obesity increases metabolic risk and induces motor dysfunction by means of different biological mechanisms and with a different impact within the obese female population.