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Factor analysis of metabolic syndrome components in obese women.

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Background and aim: Factor analysis is a multivariate correlation technique that is frequently employed to characterise the clustering of intercorrelated abnormalities, which underlie the metabolic syndrome in cohorts of individuals with different characteristics. To our knowledge, it has never been used to identify the components of this syndrome in obese subjects. The purpose of this study was to use factor analysis to investigate the clustering of features, which characterise the metabolic syndrome, in a cohort of 552 obese women aged 18-83 years (mean body mass index:  $43.0 \text{ kg/m}^2 \pm 5.7 \text{ SD}$ ).

Methods and results: Principal component analysis reduced ten correlated physiological variables, to four uncorrelated factors that explained 72.2% of the variance in the original parameters. These factors were interpreted as: (1) an insulin resistance factor, with positive loading of fasting serum insulin and homeostatic model assessment of insulin resistance; (2) a metabolic glucose/lipid factor, with positive loading of fasting plasma glucose, triglycerides, waist-to-hip ratio, and inverse loading of high density lipoprotein cholesterol; (3) a body mass factor, with positive loading of body mass and waist circumference; and (4) a blood pressure factor, with positive loading of systolic and diastolic blood pressure.

Conclusion: The identification of four independent factors is consistent with previous findings among samples of different populations and may also support, in obese women, the hypothesis that multiple physiological determinants are responsible for the abnormalities underlying the metabolic syndrome. Nonetheless, findings in this cohort of obese women suggest that the absolute degree of adiposity is not correlated with any tested component of the metabolic syndrome, but that the relative fat distribution is highly correlated with the development of hyperglycaemic and dyslipidaemic phenomena. Furthermore, insulin resistance appears to be a major factor in obese individuals, independent of other metabolic and anthropometric abnormalities.

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