Early predictors of incipient metabolic syndrome in an Arab population

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Abstract

Background: Metabolic syndrome is defined by a constellation of abnormal metabolic factors that directly increase the risk for type 2 diabetes and cardiovascular disorders. In the Gulf Cooperation Council region, the prevalence of metabolic syndrome in the population is higher than in most developed countries, with generally greater rates for women, often higher than 40%. Thus, early clinical identification of patients is important to adequately implement treatments to reduce their risk of subsequent metabolic disease. Aim: The aim of this study was to investigate the hypothesis that in sedentary subjects, post-prandial hyperinsulinemia, despite normal levels of glucose, is an indicator of incipient diabetes. Further this lesion is associated with markers of adipose and hepatic dysfunction. Methods: 42 apparently clinically healthy residents of Qatar were studied. After a 10-hour overnight fast, subjects underwent a detailed clinical assessment, including body composition by bio-impedance, anthropometry measurements (height, weight and BMI), and blood pressure. A liquid mixed meal was administered (200 ml of 18 g proteins, 17.4 g fats and 40 g carbohydrates: total energetic value of 400 kcal) and blood sampling carried out prior to and 30 and 120 minutes after the meal.

The study was approved by the Institutional Research Ethics Committee and all subjects provided written informed consent prior to participation. Fasting serum levels of lipids {high-density lipoprotein (HDL), low-density lipoprotein (LDL), total cholesterol, and triglycerides}; liver function markers [gamma-glutamyltransferase (GGT), alkaline phosphatase (ALP), alanine aminotransferase (ALT), aspartate aminotransferase (AST), total bilirubin (TB), direct bilirubin (DB), albumin (ALB)] and; plasma glucose, insulin and pro-insulin were also determined. HOMA-IR (Homeostasis model of assessment-insulin resistance) was calculated using the following formula: (fasting insulin in mIU/L*fasting glucose in mmol/L)/22.5. Serum levels of leptin and adiponectin were measured using human 2-site ELISAs. All inter- and intra-assay CVs were less than 10%. Results: There was no difference in age, blood pressure and body composition between the two groups. However, 48% of this population showed hyperinsulinemia in the fasting state, as well as relative hyperglycemia, hyperinsulinemia and hyperproinsulinemia 2 hours after the meal challenge.

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