LETTER TO EDITOR

Early assessment of metabolic situation in young patients with hypertension may prevent subsequent adverse cardiovascular events

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Letter to the Editor

Hypertension is considered the main risk factor of cardiovascular mortality. Secular trends in highly developed countries have shown decrease in blood pressure in the young population, which has been associated with reduction in cardiovascular morbidity at later age of these individuals (1). In the Slovak population aged between 18 and 30 years, increased blood pressure is predominant in men compared to women (3:1) (2). Data on prevalence of hypertension in high school and college male students in Slovakia vary from 3 to 20 % (3, 4, 5).

According to current recommendations for diagnosis and treatment of hypertension (ESH/ECS 2003 (6)), evaluation of fasting glycaemia should be preferably included into the initial set of diagnostic tests. However, fasting glycaemia is normal when insulin resistance is compensated by increased insulin secretion. Moreover, it cannot detect also manifest impairment of postprandial glucose tolerance. DECODE study (7) has shown that 2-hour OGTT plasma glucose (2hPG) is a more reliable predictor of cardiovascular mortality than fasting plasma glucose.

While variability of different insulin assays and ethnic differences in insulin levels do not allow to set up standard criteria for insulin resistance, criteria for glucose intolerance, and thus increased risk for developing Type 2 diabetes and its macrovascular and microvascular complications, are clear and easily detectable (8). Our investigation in thirty young men with essential hypertension (age 20.8±1.5 years, mean±S.E.) with normal body weight (BMI 22.4±1.4 kg/m^2) showed that 56 % had increased normal 2hPG levels (5.6–7.8 mmol/l) compared to 17 % matched subjects with normal blood pressure. Piché et al (9) has shown in 600 patients that increased normal 2hPG is an important risk factor of cardiovascular morbidity and Type 2 diabetes independently of obesity, gender or body fat distribution. Some experts therefore recommend measurement of haemoglobin A1c or real glucose tolerance test during initial examination for hypertension in offspring of subjects with cardiovascular diseases including hypertension, or with Type 2 diabetes (10).

Epidemiological studies have shown that hyperinsulinaemia is an independent risk factor of cardiovascular diseases (11, 12). Several studies confirmed insulin resistance in hypertensive subjects with obesity (13) and overweight (14). In our study, young men with essential hypertension and BMI well below 25 kg/m^2 had a two-fold increase of fasting plasma insulin levels compared to healthy controls (15). Hyperinsulinaemia has an adverse effect on lipid metabolism characterised by increased accumulation of fat in the abdominal area and dyslipidaemia, resulting in a vicious circle of events further promoting metabolic imbalance and potentiating the proatherogenic effect of high blood pressure (16). However, our analysis of results detected mild dyslipidaemia (lower HDL- or higher LDL- or total cholesterol) also in control individuals, which may be due to nutritional habits and composition of diet in this population.

Early atheromatous changes in vessels are characterised by endothelial dysfunction, which is frequently found already in children or adolescents (17). Subjects with hypertension in our study had increased plasma levels of an indirect marker of endothelial dysfunction, i.e. plasminogen activator inhibitor 1 (PAI-1, 37.3±8.7 vs 12.5±1.7, p=0.001).

According to ATP NCMP 2003 criteria, 67 % of patients in our study displayed 3 to 4 traits of metabolic syndrome (MS), hypertension, dyslipidaemia, history of hypertension in parents, insulin resistance). Although WHO 1999 (18) criteria consider insulin resistance as the main characteristic of MS, the attention of experts is predominantly focused on obese individuals. Our

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results indicate that in order to successfully diagnose and treat MS, young males with hypertension appear to represent another important target population for longitudinal studies, such as Framingham study, evaluating the impact of early detection therapy of MS on future cardiovascular outcome.

Beta-adrenergic inhibitors represent the first-choice anti-hypertensive drugs in young patients with essential hypertension. It should be noted that chronic treatment with some of these agents is associated with worsening of insulin sensitivity and glucose homeostasis (19). Therefore, evaluation of metabolic status is required before onset of treatment in order to choose optimal agents with minimal or no negative effect on insulin sensitivity. In specific cases the use of antihypertensives from another class may be considered. Inhibitors of angiotensin converting enzyme (ACE) or of angiotensin receptor 1 (AT-1) possess some characteristics that may help to improve insulin sensitivity, dylipidaemia and endothelial dysfunction (20, 21).

In conclusion, our observations indicate that evaluation of glucose homeostasis, insulin sensitivity and endothelial function may represent an essential step in early diagnosis of hypertension in young individuals, which may lead to adequate lifestyle and pharmacological intervention decreasing the risk of atherosclerosis and its cardiovascular complications in later life.

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