SHORT COMMUNICATION

Insulin levels in Gipsy minority

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Abstract

Hyperinsulinemia and other associated metabolic factors, including hyperglycemia, dyslipidemia, hypertension, and central obesity lead to increased cardiovascular risk and indicate a metabolic syndrome. Levels of fasting insulin were measured in an ethnic Gipsy minority group (n=149) and compared to the majority Slovak population (n=197). The average insulin level was significantly increased in the minority group with a 21% risk value vs 5%. Hyperglycemia was equal in both groups (17% in Gipsy group, 16% in majority group). The incidence of other risk factors for cardiovascular disease and metabolic syndrome is greater in the Gipsy group (47% vs 38% – hypertriacylglycerolemia, 62% vs 46% – HDL-cholesterol level below safety limit, 16% vs 10% – systolic hypertension, 20% vs 11% – diastolic hypertension, 36% vs 22% – obesity). The results of hyperinsulinemia, hypertriacylglycerolemia, hypo-HDL-cholesterolemia, hypertension and obesity indicate, that the Gipsy population is at higher risk for cardiovascular disease. (Tab. 1, Fig. 1, Ref. 12.)

Key words: insulin, Gipsy population, majority population.

A number of newer “nontraditional” cardiovascular risk factors have been identified based on recent studies of the pathogenesis of atherosclerosis and atherothrombotic cardiovascular events. Insulin represents a group of non-lipid risk factors (Oparil and Oberman, 1999). Hyperinsulinemia and insulin resistance are commonly observed in subjects with hypertension and related cardiovascular disease (Ferraminni et al, 1987) and together with other laboratory and clinical findings, such as hyperglycemia, dyslipidemia, obesity, refer to a metabolic syndrome or syndrome X (Reaven et al, 1996).

This study evaluated the insulin fasting levels and other cardiovascular risk factors in the Gipsy minority group in comparison to majority Slovak population.

Material and methods

Group of volunteers consisted of 149 healthy Gipsy probands and 197 subjects of majority population from western Slovakia (Gbely region). Western Slovakia is a region with higher density of Romanies. Both groups were randomly selected from age span 19–60 years with the same number of probands in every age decade. Subjects with cardiovascular diseases, cancer, diabetes, renal diseases and thyroid gland disease were excluded. The study was done in cooperation with the district physician. Group characteristics are presented in Table 1.

Blood samples were collected in the standard way. EDTA was used as an anticoagulant. Serum insulin values were detected by electrochemiluminescence immunoassay (Elecsys Insulin test, Roche). Levels of triacylglycerols, HDL-cholesterol and glucose were assessed by automatic analyzer Vitros 250 (Johnson & Johnson) by standard laboratory methods. C-reactive protein values were detected by immunoturbidimetric method using high sensitivity test (Randox). Plasma total homocysteine levels were measured by HPLC method with fluorescence detection and SBF as the derivation agent (Vester and Rasmussen, 1991).

The survey was carried out in Spring. Anthropometric characteristics (body mass index = weight/height²) and a lifestyle Institute of Preventive and Clinical Medicine, Bratislava, and Hospital of Defense Ministry, Bratislava, Slovakia

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Results and discussion

The strength of the association of hyperinsulinemia and cardiovascular disease was recently assessed in a meta-analysis of prospective population-based cohort studies and nested case-control studies (Ruige et al, 1998). These studies suggested that elevated insulin levels per se may lead to hypertension and atherosclerotic vascular disease (Ferramini et al, 1987; He et al, 1999). Other metabolic factors, including hyperglycemia and dyslipidemia, may account for the increased risk of cardiovascular disease in subjects with insulin resistance. The insulin resistance syndrome was defined as the presence of insulin resistance in combination with at least two of the following conditions: hyperglycemia, hypertension, dyslipidemia or central body obesity.
The average level of insulin was significantly increased in the minority group with an incidence of risk values of 21% of Romani vs 5% of majority subjects (Tab. 1). The incidence of hyperglycemia is equal in both groups (Tab. 1). The Gipsy group had a higher frequency of systolic and diastolic blood pressure above the normal limit (16% vs 10% – systolic, 20% vs 11% – diastolic). The occurrence of dyslipidemia was higher in the Gipsy group (Tab. 1), which is in agreement to our previous study (Krajcová, Kudlacková et al., 2002). Risk for hyperlipidemia was found in 47% of Gipsy group vs 38% of majority population. HDL-cholesterol levels indicating a reduced risk were found in 54% of majority subjects vs only 38% of Gipsy subjects. Body mass index in obesity range was observed in 36% of Romani vs 22% of the majority group. The results are shown in Figure 1. The Figure shows the significantly increased insulin levels with risk values of body mass index, triglycerides, HDL-cholesterol, systolic blood pressure, but also C-reactive protein and nonsignificantly higher insulin level with elevated homocysteine values. The hyperinsulinemia, hypertriglyceridemia, hypo-HDL-cholesterolemia, hypertension, and obesity indicate, that the Gipsy population group is at higher risk for cardiovascular disease and metabolic syndrome.

Similar findings were described in Asian Indians. The Gipsy population is genetically related with Asian Indians because Romani belongs to the Indo-European race and their original home was Central Northern India (Gintner et al., 2001). In the study of Raji et al. (2001) showed that Indians are insulin resistant and at high risk for developing diabetes and coronary heart disease. Despite similar fasting plasma glucose levels, Indians exhibited fasting hyperinsulinemia, higher glucose and insulin levels during the oral glucose tolerance test, lower HDL-cholesterol, and greater total abdominal and visceral fat in comparison to Caucasians. Indians had greater central obesity and insulin resistance compared to European whites (Chambers et al., 2001). The literature findings and our results confirmed this also for American Romanies (Sutherland, 1992). Ethnic origin differences for the incidence of insulin resistance and metabolic syndrome were observed also in black and white non diabetic women from South Africa (Merve et al., 2000). Black women demonstrate a higher degree of insulin resistance.

**References**


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