

Screening for Metabolic Syndrome in an Ethnic Minority Group in Hungary

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Abstract

The health status of the biggest ethnic minority group in Hungary was reported to be worse than that of the total population, therefore, it can be supposed that the prevalence rate of the metabolic syndrome is high among roma (gipsy) population. A screening procedure was initiated among gypsies aged between 20 and 70 years and living in town Győr and Tét. Subjects with known diabetes were excluded. At screening, anthropometric and physical investigations were performed followed by an oral glucose tolerance test with 75 g glucose. Blood glucose and fasting serum lipid values, CRP, fibrinogen and adiponectin were measured. The diagnosis of the metabolic syndrome was based on ATP III criteria. Among 77 subjects screened (35 men, 42 women; age 46.9±10.6 years; x±SD) diabetes mellitus was found in 14 cases (18.2 %) while impaired glucose regulation (IFG, IGT) was observed in 14 cases (18.2 %). Components of the metabolic syndrome were found as follows: hypertension 47 cases (61.0 %), abnormal waist circumference 40 cases (51.9 %), abnormal HDL-cholesterol 39 cases (50.6 %), abnormal serum triglycerides 35 cases (45.5 %) and abnormal fasting blood glucose 15 cases (19.5 %). Metabolic syndrome was diagnosed in 39 subjects (50.6 %) with no significant predominance in gender. Some clinical characteristics and laboratory findings that are not presented in the ATP III diagnostic criteria regarding subjects with (n=39) versus without (n=38) metabolic syndrome (MS) are shown in table.

	Age (years)	BMI (kg/m ²)	HOMA	Postchallenge insulin (μU/ml)	CRP (mg/l)	Fibrinogen (g/l)	Adiponectin (ng/ml)
With MS	50.4±9.8	34.3±8.0	5.3±4.8	84.1±72.7	6.62±5.93	3.98±0.83	0.97±0.38
Without MS	43.4±10.3	26.3±4.9	2.7±2.5	48.7±56.2	4.28±7.10	3.77±0.97	1.66±1.22
p value	<0.05	<0.001	<0.01	<0.05	NS	NS	<0.001

In order to prevent the cardiovascular consequences of the metabolic syndrome and to prevent the development of the metabolic syndrome itself, continuous health promotion should be provided for gipsy population in Hungary.

Diagnosis of the metabolic syndrome

ATP III criteria (at least 3 of the following 5 conditions)

Abdominal obesity	waist circumference >102 cm (men) > 88 cm (women)
Raised serum triglycerides	≥1.69 mmol/l (≥150 mg/dl)
Abnormal serum HDL-cholesterol	<1.04 mmol/l (<40 mg/dl) for men <1.29 mmol/l (<50 mg/dl) for women
Abnormal blood pressure	≥130/≥85 Hgmm*
Abnormal fasting blood glucose	≥6.1 mmol/l (≥110 mg/dl)

*or treated hypertension irrespective of the actual blood pressure values

Background

The burden of type 2 diabetes mellitus is well recognised. The pathogenesis and the pathomechanism of type 2 diabetes have been reconsidered in the light of the theory of the metabolic syndrome. According to this widely accepted concept, the evolution of glucose intolerance could be explained by insulin resistance and consecutive hyperinsulinaemia as well as by impaired insulin secretion at a later stage. It has been documented that further clinical characteristics of the metabolic syndrome and the accelerated atherosclerosis could be associated with hyperinsulinaemia. Therefore, primary prevention of type 2 diabetes and screening of subjects at risk for metabolic syndrome are of considerable importance.

It is well documented that the prevalence rate of the metabolic syndrome could be high in certain minority groups.

In Hungary, the gipsy population can be considered the biggest ethnic minority group.

Results

The prevalence rate of abnormal clinical/laboratory findings in the screened population (n=77)

	Men (n=35)	Women (n=42)	Total (n=77)
Abdominal obesity	17 (48.6 %)	23 (54.8 %)	40 (51.9 %)
Raised serum triglycerides	18 (51.4 %)	17 (40.5 %)	35 (45.5%)
Abnormal serum HDL-cholesterol	16 (45.7 %)	23 (54.8 %)	39 (50.6 %)
Abnormal blood pressure	23 (65.7 %)	24 (57.1 %)	47 (61.0%)
Abnormal fasting blood glucose	9 (25.7 %)	6 (14.3 %)	15 (19.5%)

Newly diagnosed diabetes mellitus: 14 subjects (18.2 %)
Impaired glucose regulation (IGT, IFG): 14 subjects (18.2 %)

Metabolic syndrome was found in 50.6 % of subjects screened with no significant predominance in gender (men: 57.1 %; women: 45.2 %, p>0.05)

Number of abnormal characteristics	Men (n=35)	Women (n=42)	Total (n=77)
0	5 (14.3 %)	7 (16.7 %)	12 (15.6 %)
1	30 (85.7 %)	35 (83.3 %)	65 (84.4 %)
2	23 (65.7 %)	28 (66.7 %)	51 (66.2 %)
3	20 (57.1 %)	19 (45.2 %)	39 (50.6 %)
4	9 (25.7 %)	10 (23.8 %)	19 (24.7 %)
5	1 (2.9 %)	1 (2.4 %)	2 (2.6 %)

Prevalence rate of the metabolic syndrome in our ethnic minority group: 50.6 %
(57.1 % in men, 45.2 % in women; p>0.05)

Some characteristics of gipsy population in Hungary

Estimated number of gypsies: 450.000 600.000

Number of total inhabitants in Hungary: 10.000.000

At present, every 8th newborn has at least one gipsy parent.

Life expectancy of gypsies is 10 years less than that of non-gipsy population.

Leading causes of death among gypsies: cardiovascular events

Marriage among relatives is high (20.9 %).

Aim

The aim of our study was to evaluate the clinical-laboratory characteristics and the prevalence rate of the metabolic syndrome in the biggest ethnic minority group (gipsy population) in Hungary.

Clinical and laboratory characteristics in subjects with and without metabolic syndrome (x±SD)

	Metabolic syndrome		Significance p value
	yes (n=39)	no (n=38)	
Age (years)	50.4±9.8	43.4±10.3	<0.05
BMI (kg/m ²)	34.8±8.0	26.3±4.9	<0.001
Systolic blood pressure (mmHg)	138.5±21.2	121.2±16.4	<0.001
Diastolic blood pressure (mmHg)	85.5±8.5	79.8±9.1	<0.01
Waist-hip ratio	0.92±0.08	0.87±0.07	<0.01
Waist circumference (cm)	107.8±12.5	96.2±13.2	<0.001
Fasting blood glucose (mmol/l)	6.77±3.29	5.16±0.66	<0.01
Post-challenge (120 min) blood glucose (mmol/l)	9.58±5.51	5.68±1.38	<0.001
Fasting plasma insulin (μU/ml)	17.4±9.6	11.6±9.9	<0.05
Post-challenge (120 min) plasma insulin (μU/ml)	84.1±72.7	48.8±56.2	<0.05
Serum total cholesterol (mmol/l)	5.67±0.96	5.55±1.86	NS
Serum triglycerides (mmol/l)	3.36±3.19	1.72±2.47	<0.05
Serum HDL-cholesterol (mmol/l)	1.09±0.19	1.37±0.37	<0.001
HOMA-index	5.26±4.37	2.73±2.45	<0.01
CRP (mg/l)	6.62±5.93	4.28±7.10	NS
Adiponectin (ng/ml)	0.97±0.38	1.66±1.22	<0.001
Fibrinogen (g/l)	3.98±0.83	3.77±0.97	NS

NS: non significant (Student unpaired test)

Patients

Gipsy subjects of both sexes aged from 20 to 70 years were referred by general practitioners for screening. Subjects known to have diabetes mellitus were excluded.

Total number of subjects screened: 77 (35 men, 42 women)
Age: 46.9±10.6 years

Site of screening: Győr and Tét (north-west part of Hungary)

Methods

Anthropometric measurements: body mass index (BMI), waist-hip ratio (WHR) waist circumference

Blood pressure: sitting position (mean values of 4 measurements)

Oral glucose tolerance test (OGTT) 75 g glucose

Laboratory measurements: 0 min: blood glucose, plasma insulin, lipid values, CRP, fibrinogen, adiponectin
120 min: blood glucose, plasma insulin

HOMA : fasting plasma glucose (mmol/l) x fasting plasma insulin (U/ml) divided by 22.5

Conclusion

In order to prevent the cardiovascular consequences of the metabolic syndrome and to prevent the development of the metabolic syndrome itself, continuous health promotion should be provided for gipsy population in Hungary.