CASE REPORT

Metabolic Syndrome – Theory and Practice

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ABSTRACT

Introduction: Due to sedentary lifestyles and excessive calorie intake, metabolic syndrome is becoming increasingly common health problem in the world, as well as in our country, and it is estimated to occur in 30% of the population of middle and older age. The metabolic syndrome is a combination of disorders that include: obesity, insulin resistance, glucose intolerance, impaired regulation of body fat and high blood pressure. Complications resulting from metabolic syndrome significantly reduces quality of patient’s life and represents a huge socio-economic burden. Metabolic syndrome therapy is directed to reduce all risk factors, and that means the change of lifestyle, which includes a reduction of body weight, physical activity, antiatherogenic diet and smoking cessation. Medical therapy is aimed to the individual risk factors.

Case report: In case of our patient, despite the optimal standard therapy, including drugs for the regulation of LDL and HDL cholesterol and triglycerides, an intensive control of blood pressure and glucose, failure to implement the recommended treatment led to a myocardial infarction.

Conclusion: The fundamental problem is not the lack of efficacy of available therapeutic measures, medications and procedures, but in insufficient implementation.

Key words: metabolic syndrome, obesity, atherogenic dyslipidemia, insulin resistance, hypertension, statins, fibrates.

1. INTRODUCTION

The metabolic syndrome is a combination of disorders that include: obesity, insulin resistance, glucose intolerance, impaired regulation of body fat and high blood pressure. The two most significant risk factors for development of the metabolic syndrome are a large amount of fat around the abdomen (visceral obesity) and resistance of peripheral tissue cells to the effects of insulin. Metabolic syndrome is a collection of high-risk factors that lead to development of coronary disease and diabetes type 2 (1).

Due to sedentary lifestyles and excessive calorie intake, metabolic syndrome is becoming increasingly common health problem in the world (2, 3), as well as in our environment, and it is estimated to occur in 30% of the population of middle and older age. Complications related to the metabolic syndrome significantly reduce quality of life of the patients, and represents a huge socio-economic burden.

Criteria for clinical diagnosis of the metabolic syndrome:

• Any three out of the five listed parameters has to be met
• Increased waist circumference (specific for certain population); 
• Elevated triglyceride (medication treatment of hypertriglyceridemia) ≥ 1,7 mmol/L, Reduced HDL (≤ 1,0 mmol/L (male) < 1,3 mmol/L (female); 
• Increased blood pressure (antihypertensive therapy) Systolic ≥ 130 mmHg and/or Diastolic ≥ 85 mmHg;
• Elevated fasting plasma glucose (medication treatment of hyperglycemia) ≥ 5,6 mmol/L;

The values of the IDF used to measure waist circumference (WS (waist size) <94 cm for male; WS <80 cm for female) correspond to the values of body mass index (BMI) of 25 kg/m², while the value used by the AHA/NHLBI (WS <102 cm for male, WS <88 cm for female) correspond to the values of BMI 30 kg/m².

Various guidelines were developed with the aim of reducing the incidence of metabolic syndrome, and their fundament is change of bad habits that lead to the development of metabolic syndrome. Many risk factors for the metabolic syndrome are well known. It is believed that central-obesity and insulin resistance are the key indicators for its development (4, 5, 6), but also environmental and genetic factors have an influence too. The most significant risk factors of the environment include lack of physical activity, smoking and fast food consumption, that is rich with fats and carbohydrates, which consequently leads to obesity. Lower socioeconomic status is associated with an increased risk of metabolic syndrome development, as well as some psy-
choresocial factors, depressive symptoms and exposure to stressful life events (7, 8).

2. CASE PRESENTATION
Male, age of 46, works in a construction company, a laborer, married, has two children. Has not been examined for a longer period of time, wants to do laboratory tests.

Currently is feeling well, but sometimes he feels anxiety in the body, weakness, headache, and in the last month is getting tired more quickly, with occasional choking sensation, has swollen legs below the knees. He has been smoking 20-25 cigarettes a day, from the age of twenty, with dinner drinks 3-4 beers, has irregular meals, but likes to eat abundantly, has low physical activity. Concerned about his job, because the company operates poorly. His father has been smoking for a longer period of time, wants to do laboratory tests. He has been smoking for a longer period of time, wants to do laboratory tests.

3. DISCUSSION
The metabolic syndrome, prediabetes and type 2 diabetes are closely connected and are overlapping in a large amount. Almost 75% of people with prediabetes and about 85% of people with type 2 diabetes have metabolic syndrome. In people with the metabolic syndrome, relative risk for developing cardiovascular disease is 1.9 to 3, depending on the criteria that was used in defining.

Therapy of metabolic syndrome is aimed at reducing all risk factors. The basis of treatment is lifestyle changes, which include body weight reduction, physical activity, anti-atherogenic diet and smoking cessation. Medical therapy focuses on the individual risk factors. Includes drugs for lipid disorders, antihypertensives, oral hypoglycemic agents, antiplatelet therapy, medications for endothelial dysfunction treatment and treatment of obesity, as well as surgical intervention.

The drug of first choice in the treatment of hyperglycemia is metformin due to its pharmacological advantages, such as good blood glucose control with minimal side effects and a reduced potential for interactions with other medications. After 3-6 months of the treatment with metformin, if Hba1c <6%, an additional oral antidiabetics (Acarbose, Sulfonylureas, Pioglitazone, Glipizide, DPP-4 inhibitors, GLP-I analogs) or insulin (if Hba1c > 7.5%) will be included in therapy. For antihypertensive pharmacotherapy of patients with metabolic syndrome, advantage will be given to ACE inhibitors and angiotensin receptor blockers for blocking the RAAS (renin-angiotensin-aldosterone system).

In the treatment of lipid disorders, primarily atherogenic dyslipidemia, the drugs of choice will be those that can reduce macrovascular residual risk, which is attributed to elevated levels of triglycerides and reduced HDL cholesterol value. This is typical lipid profile in patients with type 2 diabetes, metabolic syndrome and the patients with pre-existing cardiovascular disease (9). Remaining macrovascular risk was present in diabetic patients, as well as in non-diabetics, but patients with diabetes were significantly more vulnerable. In the treatment of atherogenic dyslipidemia, which involves elevated levels of triglycerides and low HDL cholesterol value, fibrates are the drugs of choice, which may be used together with statins, in the case of combined dyslipidemia.

Lifestyle changes or addition of fibrates, and/or omega-3 fatty acids in the statin treatment, improves the regulation of lipid parameters, significantly delays development of atherosclerosis and reduces the residual vascular risk (10, 11).
Lowering LDL by 1 mmol/L using statins reduces the risk of a major coronary event by 23%, and 77% of the remaining cardiovascular risk remains “uncovered” (12). In the case of our patient, despite the optimal standard therapy that included drugs for the regulation of LDL and HDL cholesterol and triglycerides, an intensive control of blood pressure and glucose, failure to implement the recommended treatment led to a myocardial infarction.

4. CONCLUSION

The prevalence of metabolic parameters that make up metabolic syndrome could be drastically reduced by changing lifestyle. It is necessary to educate patients about the reductive healthy diet, importance of physical activity, was for treating hyperglycemia, hypertension, dyslipoproteinemia by a rational use of drugs, when the effect of primary treatment is not enough. The fundamental problem is not the lack of efficacy of available therapeutic measures, medication and treatments, but in insufficient implementation. Family history (anamnesis) is particularly important, the attention should be given to children at-risk, and these children are from the families who’s members suffered from metabolic syndrome, diabetes mellitus or gestational diabetes, obese boys and girls, visceral obesity form or ovarian hyperandrogenism.

Early detection of metabolic syndrome factors is likely to reduce not only its incidence in the childhood, but it could also significantly reduce the prevalence of this condition in the adult population.

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