

Cardiovascular Risk in Metabolic Syndrome and Medial Arterial Calcification

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OBJECTIVES: The Metabolic syndrome (MS) is characterized by a collection of risk factors that increase the chance of developing cardiovascular complications - heart diseases (myocardial infarction, arrhythmias, heart failure, sudden cardiac death) and even stroke. Waist circumference is an independent predictor for increased risk of coronary heart disease. Medial arterial calcification (MAC) most commonly occurs in patients with diabetes mellitus and MS. It is a marker of increased cardiovascular mortality. Our goal was to document the presence of different forms of cardiac arrhythmias and myocardial ischemia, as significant factors in patient prognosis.

METHODS: We examined by Holter ECG monitoring 41 patients (25 men, 16 women) with diabetes mellitus type 2 and identified MAC (ABI - Ankle-Brachial Pressure Index >1.3). Mean age of 59 ± 8 years. Holter ECG monitoring with an average duration of recording 22.36 hours, was carried out by GE-Marquette MARS PC ambulatory ECG Holter system. The device enables the analysis of arrhythmias and ischemia. We also performed ambulatory blood pressure monitoring (ABPM) with Cardiosoft-Tonoport V, General Electric (USA) device. The ABI was determined using the BOSO ABI- System 100 (Germany).

RESULTS and DISCUSSION: We found frequent incidence of cardiac arrhythmias and myocardial ischemia in 22 patients (53.7 %). Only 19 patients (46.3 %) had normal Holter ECG recordings. ABI values were significantly higher in patients with abnormal ECG Holter recordings, in both cardiac arrhythmias and myocardial ischemia. During 1 year follow-up 4 patients have died in a domestic environment. Coronary artery atherosclerosis in diabetics occurs earlier than in non-diabetic patients and reaches a wider range. In our group of diabetics, 15 patients (36.6 %) have already overcome major vascular complications (myocardial infarction or stroke). These findings are consistent with the occurrence of metabolic syndrome (MS) in our study group (75.6 %), since people with MS have increased overall and cardiovascular mortality. Classifications and definitions of the metabolic syndrome indicate that on its pathogenesis, as well as on resulting complications, five fundamental components do participate – obesity, insulin resistance, endothelial dysfunction, aggregation of other components and diurnal pattern loss. The prognosis is worsened also by the high prevalence of arterial hypertension (85.4 %).

Tab. Results of the Holter ECG monitoring

ECG Holter recording finding	n	%
Normal recording – without ischemia or arrhythmia	19	46.3%
Atrial fibrillation	6	14.6%
Complex forms of arrhythmia - Lown III B	12	29.2%
Complex forms of arrhythmia - Lown IV A	6	14.6%
2 nd degree A-V block Mobitz type I	1	2.4%
Myocardial ischemia	10	24.4%

Note: Some patients had multiple conditions.

CONCLUSIONS: High incidence of cardiac arrhythmias and/or myocardial ischemia was found during Holter ECG monitoring. These findings contribute to the poor prognosis of patients with metabolic syndrome and medial arterial calcification. Both are associated with increased mortality due to cardiovascular causes. The higher the ABI value, the higher the cardiovascular risk. Holter ECG monitoring play an important role in the further management of these patients.