PREMATURE MYOCARDIAL INFARCTION IN ADULTS AGED 30-40 YEARS: RISK FACTORS, PATHOGENETIC MECHANISMS, AND PREVENTION

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Background. Premature myocardial infarction (MI) in young adults represents an important clinical and public health problem. Although MI has traditionally been associated with older age, acute coronary events increasingly affect individuals of working age, including adults aged 30-40 years. MI occurring at a young age may result in substantial social and economic consequences due to premature disability, loss of working capacity, and an increased risk of recurrent cardiovascular events. The development of MI in this population may involve not only conventional cardiovascular risk factors but also endothelial dysfunction, systemic inflammation, thrombophilic states, psycho-emotional stress, and psychoactive substance use. A better understanding of these factors is therefore essential for improving early diagnosis, risk stratification, and preventive strategies.

Aim. To assess the major cardiovascular risk factors, clinical characteristics, and potential pathogenetic mechanisms associated with myocardial infarction in adults aged 30-40 years and to identify key approaches to primary and secondary prevention.

Material and Methods. A retrospective analysis of medical records and clinical and laboratory data was performed in patients aged 30-40 years who were hospitalized with acute myocardial infarction at the Republican Specialized Scientific and Practical Medical Center of Cardiology. The analysis included conventional cardiovascular risk factors, including smoking, dyslipidemia, arterial hypertension, family history of cardiovascular disease, obesity, and diabetes mellitus. Potential non-traditional and pathogenetic factors were also assessed, including markers of systemic inflammation, thrombophilia-related parameters, hyperhomocysteinemia, psycho-emotional stress, and psychoactive substance use. Clinical characteristics and short-term outcomes were evaluated in relation to the identified risk factors and presumed mechanisms of coronary injury.

Results. Male patients predominated among the examined patients. The most prominent modifiable cardiovascular risk factors were smoking, atherogenic dyslipidemia, and abdominal obesity. A considerable prevalence of chronic psycho-emotional stress was also observed. Cases of narcotic and psychostimulant substance use were identified, with these exposures potentially contributing to coronary vasospasm and thrombosis, including in patients with intact or minimally altered coronary arteries.

In a subset of patients, laboratory findings suggested the presence of hereditary or acquired thrombophilic states, elevated homocysteine concentrations, and increased systemic inflammatory activity, including elevated C-reactive protein and interleukin-6 levels. These findings indicate that endothelial dysfunction, inflammation, and prothrombotic mechanisms may contribute to the development of MI in young adults in addition to the classical atherosclerotic pathway.

Timely reperfusion therapy was associated with a favorable immediate clinical course; however, the long-term risk of recurrent cardiovascular events remained clinically relevant, particularly in patients who did not modify their lifestyle and cardiovascular risk factors.

Conclusion. Myocardial infarction in adults aged 30–40 years is a multifactorial condition that cannot always be explained solely by conventional atherosclerotic coronary artery disease. In addition to

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traditional cardiovascular risk factors, endothelial dysfunction, systemic inflammation, thrombophilic conditions, psycho-emotional stress, and psychoactive substance use may contribute to the development of premature MI. These findings support the need for early identification of cardiovascular risk factors in young working-age adults, individualized diagnostic assessment, and differentiated primary and secondary prevention. Preventive strategies should focus on smoking cessation, lifestyle modification, management of dyslipidemia and obesity, correction of modifiable risk factors, psychological support, and timely elimination of harmful substance use.

Keywords: myocardial infarction; young adults; premature myocardial infarction; cardiovascular risk factors; endothelial dysfunction; thrombophilia; systemic inflammation; prevention.

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