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Clinical Features of Non-St-Segment Elevation Acute Coronary Syndrome in Patients with Autonomic Nervous System Dysfunction

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Abstract

According to the European Society of Cardiology, data show that among randomly selected patients hospitalized with acute chest pain, 65% are subsequently found not to have acute coronary pathology (15% have other cardiac conditions, 50% have non-cardiac diseases). Non-ST-segment elevation acute coronary syndrome (NSTE-ACS) accounts for up to 30% of cases, while ST-segment elevation acute coronary syndrome (STE-ACS) accounts for no more than 5% (Roffi, M. 2016). As international acute coronary syndrome (ACS) registries have shown, in-hospital mortality is higher among patients with ST-segment elevation than in those without ST-segment elevation (7% vs. 3–5%, respectively). Today, psychological support is a broad concept that includes professional assistance aimed at addressing various psychological disorders or emotional distress. Despite numerous multicenter studies, interest in investigating the manifestations of autonomic nervous system disorders in patients with NSTE-ACS remains one of the pressing and unresolved issues in international and national healthcare in both developed and developing countries.

Keywords: autonomic dysfunction, acute myocardial infarction, acute coronary syndrome, non-ST-segment elevation acute coronary syndrome, ST-segment elevation acute coronary syndrome, relative risk, post-infarction cardiosclerosis, atherosclerotic plaque.

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Introduction. The term “acute coronary syndrome” (ACS) encompasses a wide spectrum of clinical conditions, ranging from unstable angina to ST-segment elevation myocardial infarction (STEMI). In most cases, ACS results from the formation of acute thrombi associated with ruptured coronary atherosclerotic plaques. ACS falls within the broader category of cardiovascular diseases (CVDs), which

account for approximately one-third of all deaths worldwide, with an estimated 7.5 million deaths attributed to ischemic heart disease (IHD). ACS and sudden cardiac death account for the majority of IHD-related mortality, resulting in approximately 1.8 million deaths annually.

The incidence of IHD in general, and ACS in particular, increases with age, although men typically develop these conditions 7–10 years earlier than women. ACS is significantly more common in men under 60 years of age; however, the majority of patients over 75 are women, likely due to their longer life expectancy. The lifetime risk of acute coronary events is associated with exposure to traditional cardiovascular risk factors. Although mortality from ACS has decreased in recent years due to preventive measures and therapeutic advances, this trend may be reversed due to population aging and an increase in certain risk factors.

Objective. To investigate the clinical features of non-ST-segment elevation acute coronary syndrome (NSTE-ACS) in patients with autonomic nervous system dysfunction (ANSD) and to develop strategies for timely prevention of cardiovascular complications.

Materials and Methods. A total of 114 patients with ACS were examined at the Samarkand branch of the Republican Scientific Center for Emergency Medical Care (RSCEMC) and the Samarkand Regional Branch of the Republican Specialized Scientific and Practical Medical Center of Cardiology. Among them, 55 patients had NSTE-ACS without ANSD, and 59 patients had NSTE-ACS with ANSD. The study utilized clinical, biochemical, instrumental, and statistical methods.

Results. The study revealed that patients with NSTE-ACS exhibited significantly higher scores on all assessed scales. The mean Beck Anxiety Inventory (BAI) score was 34.8 ± 6.35 points, whereas patients with stable angina showed moderate anxiety with a mean score of 23.4 ± 5.4 points. Patients were divided into two groups based on the presence of autonomic dysfunction: Group 1 – NSTE-ACS with ANSD (n = 59), and Group 2 – NSTE-ACS without ANSD (n = 55). Of particular note, the mean BAI score among patients with NSTE-ACS + ANSD was 42.8 ± 8.56 points. To investigate the relationship between autonomic dysfunction and sex, the prevalence of ANSD among men and women was analyzed. It was found that ANSD was more common in men.

Additionally, the Eysenck Personality Questionnaire was used to assess mental states, including anxiety, frustration, aggressiveness, and rigidity, and the severity of these traits. Among patients with NSTE-ACS + ANSD, moderate anxiety was observed in 27.1%, severe anxiety in 57.6%, high aggressiveness in 45.8%, and pronounced rigidity in 18.6%. In contrast, patients with stable angina predominantly exhibited mild anxiety (47%) and mild aggressiveness (47%).

To determine the prevalence of risk factors among patients with NSTE-ACS with and without ANSD, factors such as hypertension, male sex, obesity, smoking, physical inactivity, and hyperuricemia were analyzed. The study found a significantly higher prevalence of these risk factors in patients with NSTE-ACS + ANSD: hypertension – 71.1%, male sex – 57.6%, obesity – 57.6%, smoking – 47.5%, physical inactivity – 77.9%, and hyperuricemia – 44.1%, all significantly higher than in patients with isolated IHD ($p \geq 0.001$).

For comparative assessment of cardiac parameters in patients with NSTE-ACS with and without ANSD, ECG and echocardiography (ECHO) data were analyzed. Left ventricular ejection fraction (LVEF) was statistically lower in NSTE-ACS patients compared to those with stable angina. Among NSTE-ACS patients with ANSD, LVEF was slightly lower than in those without ANSD. ST-segment depression was observed 20.2% more frequently in patients with ANSD than in patients without ANSD.

These findings indicate that comorbid conditions, such as psychosomatic disorders, contribute to the destabilization of IHD, which in turn increases the risk of fatal outcomes.

One objective of the study was to assess the extent of coronary artery involvement in IHD patients based on the presence of ANSD. Upon hospital admission, diagnostic coronary angiography was performed in patients with NSTE-ACS. The procedure involved femoral artery catheterization (25.2%) and radial

artery catheterization (74.8%). A total of 92 patients were examined; in 18 patients (19.5%), no hemodynamically significant coronary lesions were found. Single-vessel disease was observed in 27 patients (29.34%), two-vessel disease in 12 patients (13.04%), three-vessel disease in 16 patients (17.39%), and more than three vessels were affected in 19 patients (20.65%).

Conclusions. Among the examined patients during periods of IHD destabilization, 51.7% exhibited autonomic nervous system dysfunction, accompanied by frequent ECG changes, including ST-segment depression and T-wave inversion, predominantly in men. Destabilization of IHD was associated with changes in lipid profile (atherogenic index) and an increased number and severity of coronary artery lesions, correlating with the degree of anxiety as measured by the Beck, GAD-7, and Eysenck scales. Despite recent advances in ACS treatment, IHD remains a major public health concern. Patients with ACS are at significantly higher short-term and long-term risk of recurrent cardiovascular events and hospitalizations. The likelihood of a recurrent cardiovascular event or death is highest immediately after ACS or within the following 12 months and continues to increase over subsequent years.

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