ВНУТРЕННИЕ БОЛЕЗНИ

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MODERN ASPECTS OF ACUTE MYOCARDIAL INFARCTION

Akhmedova D.T.[1,2], Alimova D.A.[1], Trigulova R.Kh.[1]
[1]Republican specialized scientific and practical medical center,cardiology, Tashkent
[2]Tashkent medical academy

XULOSA

O’tkir miokard infarkti – yurakni ta’minlaydigan arteriyada qon aylanishining qisman yoki to’liq buzilishi natijasida yuzaga keladigan hayot uchun xavfli holat. O’tkir miokard infarkti holatining ba’zi zamonaviy jihatlari: kasallik shakllarining xilma-xilligi. Bemorning shikoyatlari va belgilariga qarab, masalan, anginal, astmatik, gastralgik, miya, aritmik, shish, og’riqsiz va kamsimptomli shakllar mavjud. Og’riq sindromining intensivligi kichikdan chidab bo’lmas darajada o’zgarishi mumkin, alomatlar to’lqinga o’xshash va 20 daqiqadan bir necha soatgacha davom etishi mumkin. Asoratlar: ulardan eng keng tarqalgani yurak ritmi va o’tkazuvchanligining buzilishi bo’lib, bu tashhis bilan barcha bemorlarning 95% da kuzatiladi.

Kalit so`zlar: *miokard infarkti, yurak-qontomir o’limi, yurak etishmovchiligi, biomarkerlar, yurak ritmining buzilishi, reperfusion terapiya.*

РЕЗЮМЕ

Острый инфаркт миокарда – опасное для жизни состояние, возникающее вследствие частичного или полного нарушения кровообращения в артерии, питающей сердце. Некоторые современные аспекты состояния острого инфаркта миокарда: многообразие форм заболевания. В зависимости от жалоб и симптомов больного выделяют, например, ангинозную, астматическую, гастралгическую, церебральную, аритмическую, отечную, безболевую и бессимптомную формы. Интенсивность болевого синдрома может варьировать от незначительной до невыносимой, симптомы носят волнообразный характер и могут длиться от 20 минут до нескольких часов. Осложнения: наиболее частыми из них являются нарушения ритма и проводимости сердца, которые наблюдаются у 95% всех пациентов с этим диагнозом.

Ключевые слова: *инфаркт миокарда, сердечно-сосудистая смертность, сердечная недостаточность, биомаркеры, нарушения ритма сердца, реперфузионная терапия.*

THE AIM OF THE STUDY

To study and analyze modern approaches to diagnosis, treatment, prognosis and prevention of acute myocardial infarction, taking into account the latest scientific data, clinical guidelines and epidemiological trends, and to identify current problems and promising directions in the management of patients with this disease.

MI is defined as myocardial cell death due to prolonged ischemia. Decreased intracellular glycogen, relaxed myofibrils, and sarcolemmal destruction are the first ultrastructural changes observed within 10–15 min after the onset of ischemia [16].

The relevance of the problem of myocardial infarction is associated with a number of factors:

- Overall mortality from myocardial infarction, including prehospital, is about 45%. In 15% of this number, death occurs not because of the disease itself, but because of the development of fatal complications [4,14].
- Cardiologists note that myocardial infarction is rapidly “getting younger” – it is increasingly occurring in people who have just celebrated their 30th birthday [7].

Until the early 20th century that the first clinical descriptions appeared describing the association between thrombus formation in a coronary artery and its associated clinical features [23,3].

The high medical and social significance of AMI predetermined the implementation of several registries in our republic (Registers of 1981, 1991, 2001, 2011, «ACCORS-UZ», «REKORD - 2 AN», «ROXIM-Uz») [6,4,5]. In 2018, for the first time on a national scale, an AMI registry was launched covering all regions of the country [10].

In January-March 2022, 14.1% of deaths were among young people under 20 years old, 20-59 years old, 24.7% - among people aged 40-59 years, and 61.2% - among people aged 60 years and older. According to statistics from 01.01.2022 to 30.09.2022, 74109 deaths in Uzbekistan were due to CVD and the mortality rate from CVD fell from 61.7% to 56.2% compared to 2021 [1,9].

According to forecasts, by 2030, the cause of death of about 23.6 million people may be due to CVD, but the individual prognosis may change positively or negatively

depending on the diagnostic, therapeutic and preventive measures taken [8, 15].

A study published in 2022 compared GRACE and TIMI risk scores in predicting inpatient and late outcomes in patients with non-ST-segment elevation myocardial infarction in East Asia. Patients were assessed using TIMI and GRACE scores on hospital admission. GRACE risk scores showed better predictive ability than TIMI risk scores for both inpatient and late outcomes [12].

EUROASPIRE (European Action on Secondary and Primary Prevention by Intervention to Reduce Events) risk model, which has been validated for European patients aged <75 years [14]. Finally, the ABC-ischemic heart disease (IHD) risk model, which includes age (A), biomarkers (B) [N-terminal pro-B-type natriuretic peptide (NT-proBNP), high-sensitivity cardiac troponin T (hs-cTnT), and low-density lipoprotein cholesterol] and clinical variables (C) [smoking, diabetes mellitus (DM), and peripheral arterial disease (PAD)], showed excellent performance in predicting cardiovascular mortality in patients with CVD [20].

In the European Society of Cardiology (ESC) EURObservational Research Programme (EORP) Chronic Ischemic Cardiovascular Diseases Registry (CICD-LT), 27.1% of CCS patients were hospitalized at least once during the first year of follow-up, mostly for coronary artery disease (CAD)-related problems (11.2%) [17].

The reported incidence of hospitalization for HF in outpatients with stable CAD and no prior history of HF varies, reaching 6% at 5 years after diagnosis [19].

In the subclinical phase of CCS, the MESA study showed that the prevalence of valve calcification increased with increasing CACS (Coronary artery calcium score) in asymptomatic individuals [15, 21]. There is a positive correlation between the annual progression of aortic valve calcification and the progression of coronary artery calcification [24].

Other comorbidities such as PAD and chronic kidney disease (CKD) are associated with CCD due to shared risk factors [25, 23, 24].

Recent research into myocardial infarction (MI) has provided valuable information on treatment and prognosis, but has also identified several problems and concerns that require attention:

- Delayed diagnosis and treatment: especially in patients with atypical symptoms or in patients with non-ST-segment elevation myocardial infarction (NSTEMI). Delayed treatment may lead to worse outcome, including larger infarct size, increased risk of complications, and higher mortality.
- Elevated serum troponin levels. Patients with this level have an unfavorable short- and long-term prognosis compared to patients without such an increase [16].
- Creatine phosphokinase (CPK) activity. The earlier the peak of CPK activity in the blood occurs, the worse the prognosis for the clinical course of myocardial infarction [16].
- Inconsistencies in revascularization strategies: Some studies suggest that delayed reperfusion in NSTEMI or underuse of percutaneous coronary interventions (PCI) in certain populations leads to suboptimal outcomes.
- Aging population and comorbidities: The increasing age of the population and higher rates of comorbidities such as diabetes, hypertension, and chronic kidney disease complicate treatment and recovery.
- Gender and racial differences: Research continues to reveal gender and racial differences in MI outcomes. Women and some racial minorities often experience worse outcomes, including delayed treatment and less aggressive management.
- Post-MI heart failure: The development of post-MI heart failure remains a major problem. Despite advances in treatment, many patients develop chronic heart failure, which seriously affects quality of life and increases mortality.
- Long-term recovery and psychological impact: Although acute treatment for myocardial infarction has improved, long-term recovery remains challenging for many patients. Research shows high rates of depression, anxiety, and post-traumatic stress disorder (PTSD) in myocardial infarction survivors.
- Stent thrombosis and restenosis: New drug-eluting stents have reduced some of the risks, but there are concerns about late stent thrombosis and the need for long-term dual antiplatelet therapy.

Prothrombotic properties of the fibrin clot. They are considered as an adverse prognostic factor in clinical outcomes during a 12-month follow-up period. After adjustment for cardiovascular risk factors, each 50% prolongation of lysis time was associated with a 1.17-fold increase in the risk of cardiovascular death or recurrent myocardial infarction. A similar increase in clot density was associated with a 1.24-fold increase in the risk of death [2].

SCIENTIFIC NOVELTY OF THE WORK

The scientific novelty of this work lies in the comprehensive analysis of modern aspects of diagnosis, treatment and prognosis of acute myocardial infarction (AMI) taking into account the latest clinical studies, statistical data and international registers:

- Modern clinical and pathogenetic criteria for the diagnosis of myocardial infarction have been clarified, including the value of biomarkers (NT-proBNP, hs-cTnT, ST2), assessment of coronary calcium and the use of prognostic scales (GRACE 2.0, SCORE2, ABC-IHD).
- New approaches to risk stratification and personalized choice of therapy in patients with AMI and chronic coronary syndromes are considered.
- The article presents current data on the epidemiology and mortality from AMI, including information on the dynamics of diseases and mortality in Uzbekistan

in recent years.

- The problems and challenges of modern cardiology are analyzed: untimely diagnosis, insufficient implementation of recommendations, the influence of concomitant diseases, differences in gender and age, insufficient rehabilitation and adherence to secondary prevention.
- The latest scientific data on the influence of thrombotic properties of fibrin clot on the outcomes of AMI and post-infarction heart failure are summarized.

The author's view on modern aspects of acute myocardial infarction

Modern advances in the diagnosis and treatment of acute myocardial infarction have certainly played a key role in reducing mortality and improving the prognosis of patients. However, upon closer analysis, it becomes obvious that despite the availability of powerful evidence-based medicine tools, a significant gap remains between potential capabilities and actual clinical practice, especially in countries with developing healthcare systems, such as Uzbekistan.

The following aspects remain the most pressing:

- Diagnostic delays, especially in cases of non-standard clinical presentation and in women, require a systematic approach – from educational programs for the population to standardization of patient routing.
- Insufficient personalization of treatment: despite the availability of prognostic scales and biomarkers, their use in real practice is limited. This reduces the effectiveness of therapy and prognosis in certain categories of patients (elderly, with comorbid pathology).
- The problem of secondary prevention in Uzbekistan is of particular importance. The absence of a universal system of cardiac rehabilitation and insufficient attention to psychological aspects (PTSD, anxiety, depression) limits recovery after a heart attack.
- Low adherence to therapy is associated not only with socio-economic factors, but also with a lack of comprehensive communication between the doctor and the patient.
- Gender and age differences in outcomes remain poorly understood in the local context. There is a need to focus on individualized approaches to managing women and young patients, who are increasingly being diagnosed with infarction.

An effective solution to these problems is possible only with the transition from a highly specialized to an interdisciplinary approach, where the treatment of AMI goes beyond the acute period and covers the entire system of prevention, rehabilitation and support of the patient throughout life. In this context, the development of digital platforms, telemedicine and multidisciplinary cardiology centers that can pool resources and improve the quality of care seems particularly promising.

Thus, a modern understanding of myocardial infarction requires not only technological solutions, but also a rethinking of the philosophy of patient care, where not only survival rates, but also quality of life, functional independence and psycho-emotional state become key.

Prospects for resolving the identified problems in the context of Uzbekistan

Uzbekistan is seeing progressive development of its healthcare system, which opens up real opportunities for addressing key issues related to acute myocardial infarction, including:

- Timely diagnostics – by expanding the network of primary vascular departments, introducing highly sensitive biomarkers (hs-cTnT, NT-proBNP) into clinical practice, modern visualization methods (CT coronary angiography, echocardiography), as well as by training primary care physicians in the early interpretation of heart attack symptoms.
- Personalized treatment – through the implementation of clinical and prognostic models (GRACE, TIMI, SCORE2), the development of cardiology registries and electronic medical records, which allows for more accurate selection of therapy taking into account individual risk and concomitant diseases.
- Addressing the impact of comorbidities – by integrating cardiac care with programs to combat diabetes, hypertension, and chronic kidney disease, and by improving follow-up care for patients at high cardiovascular risk.
- Reducing regional and social differences in access to medical care - through the digitalization of healthcare, the introduction of telemedicine and mobile cardiology teams, as well as increasing funding and human resources for regional medical institutions.
- Improving long-term rehabilitation and psychological support - through the development of post-infarction rehabilitation centers.

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ТИЗИМЛИ СКЛЕРОДЕРМИЯ БИЛАН ОҒРИГАН БЕМОРЛАРДА СУРУНКАЛИ БУЙРАК КАСАЛЛИГИ РИВОЖЛАНИШИ

Набиева Д.А., Хидоятова М.Р., Юсупов И.К.
Тошкент тиббиёт академияси

РЕЗЮМЕ

Цель настоящего исследования – изучение частоты встречаемости хронической болезни почек (ХБП) у больных системной склеродермией (ССД). Обследовали 100 пациентов с достоверным диагнозом ССД. У пациентов выполнили общеклиническое обследование и лабораторные исследования, направленные на определение активности ССД и степени поражения внутренних органов. Рассчитывали скорость клубочковой фильтрации (СКФ), учитывали наличие сопутствующей патологии. У 88% больных с ССД выявлена ХБП, у 80% – снижение СКФ, у 81% – гипостенурия и/или протеинурия. Установлена взаимосвязь между СКФ и поражением сердца у больных ССД, степенью легочной гипертензии, индексом активности заболевания Valentini, индексом резистентности сосудов почек, наличием сопутствующей патологии почек,артериальной гипертензии и/или ишемической болезни сердца.

Ключевые слова: *системная склеродермия, хроническая болезнь почек, скорость клубочковой фильтрации.*

SUMMARY

The purpose of this study is to study the incidence of chronic kidney disease (CKD) in patients with systemic scleroderma (SSD). 100 patients with a reliable diagnosis of SSD were examined. The patients underwent general clinical examination and laboratory tests aimed at determining the activity of SSDs and the degree of damage to internal organs. The glomerular filtration rate (GFR) was calculated, the presence of concomitant pathology was taken into account. In 88% of patients with SSD, CKD was detected, in 80% – a decrease in GFR, in 81% – hypostenuria and/ or proteinuria. The relationship between SLE and heart disease in patients with SSD, the degree of pulmonary hypertension, the activity index of Valentini disease, the index of resistance of renal vessels, the presence of concomitant kidney pathology, arterial hypertension and/or coronary heart disease has been established.

Keywords: *systemic scleroderma, chronic kidney disease, glomerular filtration rate.*

Тизимли склеродермия (ТС) сурункали, кўптизимли касаллик бўлиб, тери ва ички органлар фиброзининг ривожланиши билан тавсифланади [1,5]. Касаллик ҳаёт сифатининг ёмонлашишига олиб келади [3,4], ўлимнинг кўпайиши билан [5], даволашнинг юқори нархи билан [2,6] тавсифланади. Ҳозирги кунга қадар ТСнинг патогенези тўлиқ ўрганилмаган, аммо унда қон томирларининг шаклланиши, облитерация қилувчи микроангиопатия ва фиброз [7] муҳим рол ўйнаши аниқланди, бу эса ТСнинг кеч босқичида ички органларнинг шикастланишига олиб келади [3]. Микроциркуляцион каналнинг таркибий қайта тузилиши ва умумий прогрессив васкулопатия юрак-қон томир патологиясининг ривожланишига олиб келадиган жараёнлар бўлиб, ТСда ўлимнинг асосий сабаби ҳисобланади [9]. Касалликнинг ривожланиш босқичида, юрак-қон- томир тизимининг патологияси клиник жиҳатдан ўзини намоён қилганда, васкулопатия ривожланишининг секинлашиши ва терапия фонида юрак-қон-томир тизимини қайта қуриш эҳтимоли минималдир, шунинг учун дастлабки васкулопатиянинг потенциал белгиларини аниқлаш долзарб бўлиб туюлади [8].

Юрак-қон-томир касалликларининг ривожланиши билан боғлиқ омиллар, шу жумладан касалликнинг дастлабки босқичларида сурункали буйрак