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Features of functional recovery in obese patients with acute myocardial infarction

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Abstract. The increasing prevalence of obesity within the general population necessitates the development of effective rehabilitation strategies for post-myocardial infarction patients with excess body weight. The aim of this study was to determine the impact of obesity on the functional recovery of patients undergoing rehabilitation following acute myocardial infarction. The rehabilitation outcomes of patients experiencing their first-ever acute myocardial infarction were analysed. These individuals had been admitted to a specialised cardiac intensive care and resuscitation unit, receiving treatment in accordance with established clinical protocols. The cohort included patients with class I obesity as well as those with a normal body weight. The rehabilitation programme lasted for three months and comprised physical activity, dietary habit modification, psychological support, and educational interventions aimed at preventing cardiovascular diseases. Recovery efficacy was assessed using body mass index, myocardial functional status, physical endurance level (six-minute walk test), and quality of life (SF-36). The findings demonstrated a positive effect of the rehabilitation measures on patients' functional recovery. However, it was confirmed that individuals with obesity exhibited less pronounced improvements in quality of life ($r = 0.77$; $p < 0.05$), poorer adaptation to physical exertion, and slower recovery of haemodynamic parameters compared with patients of normal weight. Excess body weight was found to complicate the rehabilitation process, reduce its effectiveness, and prolong the recovery period. This underscores the rationale for a personalised rehabilitation approach that takes into account the degree of heart failure, pre-morbid physical fitness, and comorbidities. The results obtained may be applied to the development of individualised rehabilitation programmes aimed at improving treatment efficacy, reducing complication risks, and enhancing quality of life in post-myocardial infarction patients

Keywords: acute coronary syndrome; heart failure; body mass index; rehabilitation; quality of life; exercise tolerance

Introduction

Obesity is one of the key risk factors for developing cardiovascular diseases, in particular acute myocardial infarction (MI). The growing prevalence of obesity in the world, especially among the young and working-age population, significantly complicates the course of cardiovascular pathologies and affects the effectiveness of treatment and

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rehabilitation. Functional recovery of patients after MI is a critical aspect that determines the quality of their future life, the level of working capacity, and social adaptation. In the presence of concomitant obesity, the rehabilitation process becomes more complicated, since this pathology is associated with an increased risk of recurrent cardiovascular events. In Ukraine, cardiovascular diseases are the leading cause of death, and as a result of a full-scale invasion, the number of cases of such diseases has increased significantly, which is associated with both psychological stress and limited access to timely medical care and preventive measures [1-3]. This reinforces the need to develop effective rehabilitation strategies, including those adapted to obese patients who have suffered MI. Investigation of the features of rehabilitation of such a contingent of patients after MI will improve existing cardiorehabilitation programmes, increase their effectiveness, and reduce the risk of complications.

The scientific medical literature, in the context of the treatment of heart diseases, mainly considers aspects of the correction of motor activity and nutrition in overweight patients. The study by P.A. Ades & P.D. Savage [4] analysed the evolution of cardiorehabilitation from exercise programmes designed to improve physical fitness after prolonged hospitalisation for a cardiac event, to individual interventions with different risks to alter coronary risk factors (and fitness) and the atherosclerotic process. Approaches to weight loss in cardiac patients with a wide range of diseases were considered, but insufficient attention was paid to rehabilitation issues after MI.

A randomised controlled trial of OPTICARE XL described by I. den Uijl *et al.* [5] showed the advantages of an integrated approach to the rehabilitation of obese cardiac patients compared to conventional rehabilitation programmes. But in this study, patients with heart failure were excluded, so the application of the authors' recommendations for the contingent of post-infarction patients looks unfounded. Y. Wang *et al.* [6] emphasised the importance of physical rehabilitation of patients with stable condition after emergency surgical treatment for acute myocardial infarction, which contributes to the rapid improvement of physical functions and can help patients to improve their quality of life.

In a systematic review by S. Barnason *et al.* [7], behavioural change strategies were considered as key influences in the cardiac rehabilitation programme. However, among the analysed sources, in most cases of research, patients who did not tolerate acute cardiac events were involved. C. Schon *et al.* [8] attempted to contextualise early cardiorehabilitation based on physical activity in patients with acute coronary syndrome. The researchers described the dosed exercise programme performed during hospitalisation and its effect on myocardial morphology and heart rate, and functional abilities in the long-term period after discharge. Monitoring the dose of physical activity during cardiorehabilitation was considered as a key to the effectiveness of the rehabilitation process, but only a small proportion of patients in this study showed signs of obesity.

In 2024, the American Heart Association, together with the association for cardiovascular and pulmonary rehabilitation, issued updated recommendations for rehabilitation measures in cardiac patients [9]. The developers have actually updated the scientific basis of the main components of patient assessment, nutrition counselling, weight and body composition control, cardiovascular diseases and risk factors, psychosocial management, aerobic training, strength training, and physical activity counselling. In addition, high-quality cardiac rehabilitation programmes should include a system of self-monitoring and patient feedback. High-quality programme execution is essential to improve widely documented low coverage and adherence rates, and to reduce differences in access to cardiac rehabilitation. This paper focused on weight loss strategies in cardiac patients with concomitant obesity, but does not provide clear recommendations specifically for obese patients who have recently suffered MI.

Thus, there is a lack of information on the course of recovery of functional and haemodynamic parameters in obese patients who have suffered myocardial infarction, primarily in patients after interventional revascularising interventions. The purpose of the current study was to determine the features of functional recovery in obese patients who had suffered acute myocardial infarction.

Materials and Methods

The study was conducted in 2020-2024 at the municipal non-profit enterprise of the Mykolaiv City Council "City Hospital No. 1". During this period, the effectiveness of rehabilitation of patients with grade 1 obesity, whose body mass index (BMI) was 30.0-34.9 kg/m^2 and who had suffered an acute myocardial infarction for the first time and were undergoing inpatient treatment in the intensive care unit and intensive care unit of a cardiological profile was monitored and analysed.

The study involved 150 people: 100 obese patients, who made up the main group, and 50 patients with normotrophic alimentary status (BMI = 18 - 24.9 kg/m^2) [10] – as a control group. The control group was selected according to clinical and anamnestic characteristics that were as similar as possible to the main group. Among the examined patients, men prevailed (57.0% in the main group, 60.0% in the control group). The average age of patients was 62.3 ± 1.1 years in the main group, 61.5 ± 1.8 years in the control group ($p > 0.05$).

To assess the condition of patients, the visceral obesity index (VOI) was used, which was determined according to the equations by M.C. Amato & C. Giordano [11] for men:

$$VOI = (WC/39.68 + (1.88 + BMI)) \times \times (TG/1.03) \times (1.31/HDL), \quad (1)$$

for women:

$$VOI = (WC/36.58 + (1.88 + BMI)) \times \times (TG/0.81) \times (1.52/HDL), \quad (2)$$

where *TG* – triglycerides (mmol/l); *HDL* – high-density lipoproteins (mmol/l); *WC* – waist circumference; *BMI* – body mass index. Normal *VOI* indicator should not exceed 1.1.

In this case, the class of acute heart failure (HF) was determined on the Killip scale [12]. The stage and type of chronic heart failure (CHF) were determined according to the classification of the European Association of Cardiology [13].

The diagnostic, treatment, and clinical management programme in both groups was identical and consistent with current clinical protocols. All patients underwent percutaneous interventions (stenting, balloon angioplasty) and underwent medical treatment in accordance with the current unified clinical protocols, considering concomitant pathology. The complex of rehabilitation measures lasted three months and included physical exercise, dietary modification, psychological support and education on the prevention of cardiovascular diseases. The rehabilitation programme in both groups was identical. The following indicators were used to assess functional recovery: body mass index, myocardial systolic function, exercise tolerance (according to the 6-minute walking test) [14], quality of life (QOL) according to SF-36 [15].

The study was carried out in compliance with modern bioethical requirements [16], including the requirements of Article 8 of the Law of Ukraine No. 123/96-BP "On Medical Products" [17], Directive of the European Parliament and of the Council 2001/20/EC [18]; Convention for the protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine [19], WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Participants [20]; recommendations of the World Health Organisation Global Health Ethics [21], provisions of Good Clinical Practice (GCP) [22], and the Order of the Ministry of Health of Ukraine No. 690 [23]. All patients were informed about the risks of conducting the study and publishing materials and signed an informed consent to participate in the study. The authors claim to respect the confidentiality of data and prevent any pressure.

Statistical data processing was performed by the method of variance and correlation analysis using MS Excel software (MicroSoft Inc., USA) [24]. After checking the data array for homoscedasticity depending on the type of distribution and data format, the two-way Student t-test was used for parametric data with a normal distribution, and the Mann-Whitney criterion was used for nonparametric data. When comparing the frequency of registration of various clinical phenomena, the χ^2 criterion was used. Relationship scale data was compared according to Pearson, rank data was compared according to Spearman, and binary data was compared with other data formats using a beaded correlation coefficient.

Results

Examination of patients in both groups showed that most cases of MI met the criteria for STEMI (acute ST – segment elevation myocardial infarction) – 64.0% in the main group and 66.0% in the control group. Accordingly, NSTEMI (Non-ST-elevation Myocardial Infarction) was reported in 36.0% and 34.0% of cases. In terms of the structure of complications of the acute period, the MI groups were also comparable (Table 1).

Table 1. Structure of complications of the acute period of MI

Complications	Main group				Control group			
	STEMI (n = 64)		NSTEMI (n = 36)		STEMI (n = 32)		NSTEMI (n =17)	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Acute left ventricular aneurysm	4	6.3	-	-	1	3.1	-	-
Killip III/IV	9	14.1	3	8.3	2	6.3	1	5.9
Rhythm disorders	3	4.7	1	2.8	1	3.1	1	5.9

Notes: STEMI – ST-Elevation Myocardial Infarction, NSTEMI – Non-ST-Elevation Myocardial Infarction
Source: compiled by the authors

The table below shows that acute left ventricular aneurysm occurred in 4 cases with STEMI in patients of the main group and in 1 case with STEMI in patients of the control group, that is, the clinical groups did not differ in this parameter ($\chi^2 = 0.42$, $p = 0.52$). Severe acute heart failure (stages Killip III/IV) was recorded in 9 cases with STEMI in patients of the main group and in 2 cases with STEMI in patients of the control group, which indicates the comparability of the formed groups ($\chi^2 = 1.28$, $p = 0.26$). In NSTEMI, the incidence of this complication was slightly lower, with 3 cases in the main group and 1 case in the control group, respectively, i.e., no statistically significant differences between the groups ($\chi^2 = 0.13$, $p = 0.72$). Rhythm disturbances occurred de novo in 3 patients with STEMI in the main group and in 1 – in the control group ($\chi^2 = 0.10$, $p = 0.75$), and one case in each of the clinical groups in NSTEMI ($\chi^2 = 0.31$, $p = 0.58$). Thus, the presence of obesity in MI did not significantly affect the risk of complications.

The clinical manifestations of MI in both groups were the same and included pain (72% in the main group and 76% in the control group), general weakness (64% and 66%), palpitations (22% and 20%, respectively). However, a noticeable difference between the obese group and the control group was observed with minimal physical activity – shortness of breath was recorded in 62% of patients in the main group and 42% in the control group ($p < 0.05$). Patients in the main

and control groups practically did not differ in MI localisation (Fig. 1). This, on the one hand, indicates the similarity of both groups in clinical characteristics, and on the other – the presence of subcompensation phenomena of the cardiorespiratory system in obese patients already at the time of applying to a specialised cardiology hospital.

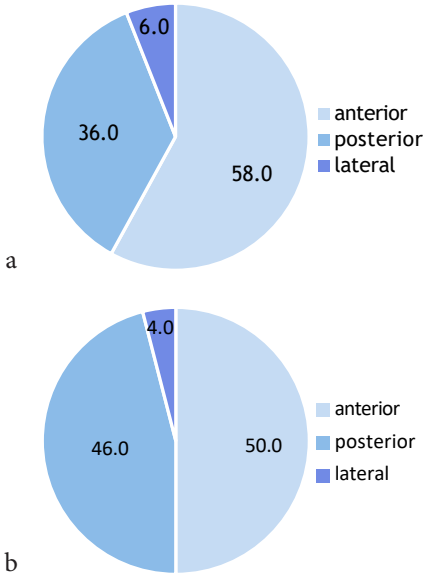

Figure 1. MI localisation in comparison groups in this study

Notes: a – main group, b –control group

Source: compiled by the authors

When assessing the comorbid background and lifestyle in patients with MI in both clinical groups, the following data were obtained. The risk factors for MI were arterial hypertension (in the main group – 82.0%, in the control group – 88%), CHD (78.0% and 74.0%), type 2 diabetes mellitus (46.0% and 28.0%), dyslipidemia (78.0% and 62.0%), smoking (46.0% and 24.0%), alcohol abuse (32.0% and 28.0%), previous coronavirus infection (10.0% and 14.0%), occupational hazards (8.0% and 12.0%, respectively). Thus, the frequency of detection of risk factors, including those that can be modified, groups practically did not differ ($p > 0.05$). All patients underwent revascularising interventions without complications, as a result of which haemodynamic parameters were improved. At the time of discharge, Simpson's left ventricular ejection fraction (LV EF) averaged 51.1 ± 0.3% in the main group and 52.6 ± 0.7% in the control group. BMI was 32.7 ± 0.3 kg/m^2 in the main group, and in the control – 23.5 ± 0.4 kg/m^2, VOI – 1.5 ± 0.1 and 1.0 ± 0.1, respectively ($p < 0.05$).

Each rehabilitation session consisted of warm-ups, up to 20 minutes of circular exercises (10 sets of 2 minutes each), and restorative exercises. All elements of the exercise were aerobic exercise, with a mix of "cardiovascular" exercises such as walking, exercise bike classes, step exercises, and "active recovery" exercises such as light dumbbell exercises or weight support exercises. All physical exercises were accompanied by respiratory gymnastics with an emphasis on diaphragmatic breathing. All patients showed clinical improvement after treatment, but at the time of discharge they had signs of chronic HF, including NYHA functional class 2 (58.0% in the main group, 66.0% in the control group) and NYHA functional class 3 (42.0% in the main group, 34.0% in the control group). Heart failure with a moderately reduced left ventricular ejection fraction (HFmrEF according to ESC) occurred in 79 (79.0%) patients in the main group and 39 (78.0%) in the control group, with a reduced ejection fraction (HFrEF phenotype according to ESC) – in 21.0% and 22.0%, respectively. These values corresponded to the following test results with a 6-minute walk: in the main group, an average of 266 ± 9 m, in the control group – 289 ± 11 m.

All patients after MI experienced a decrease in quality of life indicators, most pronounced in the subscales of physical functioning PF (physical functioning), GH (general health), and VT (vitality). Thus, in the main group, the average values on the PF scale were 59 ± 4 points, on the GH scale – 63 ± 5 points, and VT – 66 ± 3 points. In the control group, the values on the corresponding scales were quite close – 68 ± 7 points, 67 ± 5 points, and 74 ± 6 points, respectively ($p > 0.05$). After the rehabilitation, there was an improvement in systolic function, physical endurance and quality of life. Thus, LV increased in the main group to 53.7 ± 0.4% (Δ = +5.1%), and in the control group – to 56.8 ± 0.6% (Δ = +8.0%). Relative to the results of the test with 6-minute walking, the increase was on average 43 ± 3 m in the main group, and 52 ± 5 m in the control group ($p < 0.05$). But according to QOL indicators, positive dynamics were determined in the subscales of physical and role emotional functioning, general health and vitality, which were more pronounced in the control group (Fig. 2).

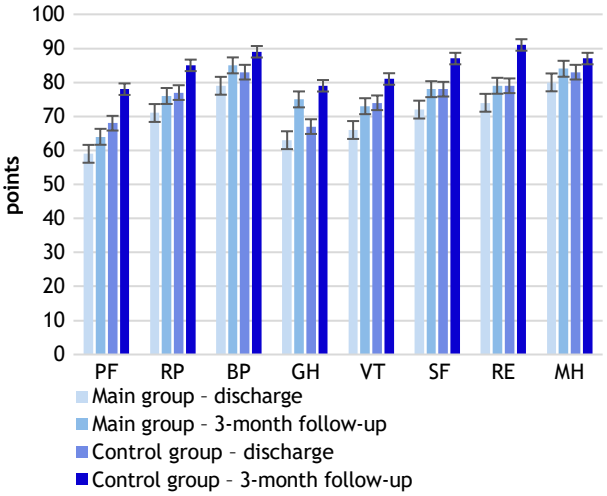

Figure 2. Changes in quality of life indicators in the examined patients

Notes: PF – physical functioning, RP – role physical functioning, BP – body pain, GH – general health, VT – vitality, SF – social functioning, RE – role emotional functioning, MN – health

Source: compiled by the authors

The above figure shows that three months after discharge, the PF subscale indicators showed a greater increase in the main group – up to 64 ± 4 points, while in the control group – up to 78 ± 6 points ($p < 0.05$). For the GH subscale, the indicators were 75 ± 5 points and 79 ± 7 points, respectively ($p > 0.05$), and for the VT subscale – 73 ± 4 points and 81 ± 5 points ($p > 0.05$). On the scale of body pain (BP), indicators in the main group increased from 78 ± 5 points to 85 ± 5 points, and in the control group – from 83 ± 7 to 89 ± 6 points ($p > 0.05$). The absence of significant differences in these subscales may be due to the low incidence of MI complications in the follow-up groups. On the social functioning scale (SF), indicators in the main group increased from 72 ± 4 points to 78 ± 5 points, and in the control group – from 78 ± 6 to 87 ± 5 points ($p < 0.05$). Thus, the QoL of patients in the recovery period after MI significantly depended on the metabolic profile of patients.

The results obtained indicate that a positive rehabilitation result was achieved in both clinical groups, but in the main group the gradients of changes were slightly lower than in the control group. Thus, the increase in the ejection fraction in the main group after 3 months averaged 5.1%, and in the control group – 8.0% ($p > 0.05$). A clinically significant increase in the results of the exercise tolerance test in the main group was recorded in 88% of patients with an increase in the distance travelled to 309 ± 8 m, and in the control group – in all patients with an increase in the distance travelled to 341 ± 11 m ($p < 0.05$).

Thus, as a result of rehabilitation, the best QOL indicators were achieved in patients with normotrophic alimentary status. A marked improvement in QOL was observed as early as 3 months after rehabilitation in all patients, but in patients of the main group, the increment of changes was less than in patients with normal body weight. The correlation between BMI and QoL increment was $r = 0.77$ ($p < 0.05$). The data obtained indicate that obese patients recover worse in terms of exercise tolerance compared to normosthenics. Thus, rehabilitation of post-infarction cardiological patients requires a comprehensive approach aimed at restoring the functional abilities of the cardiovascular system, and lifestyle modification, in particular, eating behaviour and motor activity.

Discussion

The widespread implementation of the revascularisation strategy in the treatment of MI has reduced mortality from this disease, but not all patients who have suffered a myocardial infarction return to normal life [1]. In contemporary cardiorehabilitation practice, there is a growing focus on the impact of obesity on the prognosis, effectiveness of interventions, and individualisation of recovery programmes. Excess body weight significantly modifies the results of cardiac interventions, affects the tolerance of physical exertion, and requires adaptation of the volume and intensity of rehabilitation measures. Thus, research by D. Jones *et al.* [25] showed that obesity is associated with worse outcomes in restenosis after percutaneous coronary interventions: overweight patients had an increased frequency of repeated interventions and complications, which directly affects the cardiorehabilitation strategy. The study by M. Husaini *et al.* [26], which was based on a large cohort of Medicare patients, demonstrated the benefits of an intensive rehabilitation programme over a conventional one, especially in subgroups with metabolic disorders, including obesity: a reduction in mortality and cardiovascular complications was noted with a more aggressive approach to lifestyle modification. The study by G. Chaves *et al.* [27] focused on global differences in the "dose" of cardiorehabilitation: overweight patients often do not reach the recommended duration and intensity of physical exercise, which correlates with a decrease in the effectiveness of the programme. In several review publications, in particular, G. Savarese *et al.* [28] and B. Shahim *et al.* [29], obesity was indicated as a key risk factor for heart failure, but the context of rehabilitation is not disclosed in detail. Other sources [30-32] focused on the technical aspects of interventional cardiology or drug therapy, with no emphasis on obesity or rehabilitation. Thus, current data confirm that obesity affects both the clinical effectiveness of cardiorehabilitation and the long-term prognosis, which determines the need for individualised approaches to this category of patients, considering their functional state, load tolerance, and metabolic profile.

Long-term disability, reduced quality of life, loss of self-care ability, and psychological disorders are typical consequences for a significant proportion of patients after MI. J.F. Rodriguez-Palomares *et al.* [33] and H. Yokoyama *et al.* [34] noted that these problems are aggravated in patients who have MI on the background of obesity, which significantly complicates the process of functional recovery. The combination of overweight with a sedentary lifestyle, characteristic of people after MI, forms a negative cycle, which leads to a further decrease in physical activity, the progression of comorbid pathology and a decrease in the effectiveness of cardiorehabilitation programmes.

Obesity has a systemic negative impact on the cardiovascular system not only due to mechanical stress, but also due to a number of metabolic and inflammatory mechanisms. As noted by M.P. Manoharan *et al.* [35], among the key independent risk factors in these patients are atherogenic dyslipidemia (increased triglyceride levels, decreased HDL cholesterol), signs of a chronic systemic inflammatory response (increased levels of C-reactive protein, interleukin-6), and insulin resistance. Taken together, these pathophysiological processes lead to a more severe course of MI, a less favourable response to standard therapy, and a decrease in the effectiveness of rehabilitation treatment.

Obese patients are more likely to develop complications, including acute and chronic heart failure, recurrent ischaemia, and repeated hospitalisations, which increases the overall risk of death after MI. P. Calabrò *et al.* [36] proved that the presence of obesity complicates the use of physical components of cardiorehabilitation, since it is often accompanied by orthopaedic problems, shortness of breath, and impaired load tolerance, which requires

significant adjustment of standard programmes. In addition, such patients have a higher risk of depression, anxiety disorders, and reduced motivation to participate in rehabilitation activities, which further complicates functional recovery and return to an active lifestyle. All of these factors require a multidisciplinary approach to the management of obese patients after MI, including individualisation of cardiorehabilitation programmes, psychoemotional support, and correction of metabolic status.

Features of the course of CHD in obese patients are a fairly rapid development of decompensation changes. Obese patients experience myocardial ischaemia even in the absence of occlusion of large coronary arteries [37]. Regarding the effect of obesity on myocardial perfusion, the literature data are contradictory, but most researchers agree with the presence of numerous negative metabolic changes in the myocardium that contribute to the development of heart failure in obese patients and CHD [35]. The size of myocardial necrosis is a powerful predictor of prognosis after acute myocardial infarction, as noted by I. den Uijl *et al.* [5], M. Sun *et al.* [30] and S.J. Backhaus *et al.* [38]. According to D. Jones *et al.* [25], in obese patients, the relative size of the infarction focus is larger, and reperfusion therapy is less effective due to microvascular obstruction. On the other hand, a well-known paradox is that obese and overweight patients have a lower risk of short-term mortality after MI than normal-weight patients [39, 40]. However, the association of obesity with mortality after MI and the degree of its impact on rehabilitation outcomes remained unknown until recently.

The presented study proves the importance of the comorbid background, and, above all, the features of metabolism and functional reserves in obesity for predicting the results of the rehabilitation process. Even with the first degree of obesity, both the return to a normal lifestyle and the acquisition of tolerance to moderate physical activity slows down. Current literature and large-scale reviews and analyses of registries provide conflicting data on the benefits of rehabilitation after MI, including its impact on mortality, re-hospitalisation, and quality of life [2, 4, 5]. The contradiction lies primarily in the gap between theoretical efficacy (RCT, protocol rehabilitation) and actual efficacy in population cohort data, which often show more modest results. For example, the results of the study by T.M. Brown *et al.* [9] showed that an intensive programme can reduce mortality by 20-30% in a controlled setting, whereas in Medicare or national registries, this impact often does not exceed 10% or is statistically insignificant [26].

The data obtained in the current study show that early comprehensive rehabilitation is an important tool in the treatment of patients with MI. It covers not only a set of physical exercises, but also other influences. This refers to a comprehensive cardiac rehabilitation strategy that includes, in addition, to the exercise regimen, psychosocial counselling, informing and motivational influences on smoking cessation, compliance with the medication regimen, dietary recommendations, and the use of other tools to reduce the risk of CKD progression, and recurrent acute cardiac events.

Conclusions

The study was devoted to the effect of obesity on functional recovery in patients who have suffered acute myocardial infarction. In the course of the study, the working hypothesis about the presence of a link between the metabolic status and adaptive abilities of the body was confirmed. In both clinical groups, a positive rehabilitation result was achieved, but in the presence of obesity, the positive changes were less pronounced. In particular, the increase in the ejection fraction in the main group after 3 months averaged 5.1%, and in the control group – 8.0% ($p > 0.05$). Despite the fact that these differences are statistically insignificant and were observed at the trend level, further observation revealed that a clinically significant increase in the results of the exercise tolerance test in the main group was recorded in 88% of patients with an increase in the distance travelled to 309 ± 8 m, and in the control group – in all patients with an increase in the distance travelled to 341 ± 11 m ($p < 0.05$). QoL improvement was observed as early as three months after rehabilitation. The most pronounced changes were observed in the subscales of physical and role emotional functioning. The correlation between BMI and QOL increment was $r = 0.77$ ($p < 0.05$), which indicates the importance of body weight control in post-infarction patients when implementing a rehabilitation programme.

The results of this study show that immediately after an acute heart attack, obese patients are more likely to change their lifestyle, which allowed levelling the difference in the subscales of overall health, vitality, and body pain. In addition, these lifestyle changes have been found to persist over time. It remains an open question how exactly the rehabilitation process takes place after MI, depending on the hormonal profile and the severity of oxidative stress. Prospects for further research are related to the study of gender features of functional recovery in obese patients who have suffered a myocardial infarction.

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Conflict of Interest

None.

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Особливості функціонального відновлення у пацієнтів з ожирінням, що перенесли гострий інфаркт міокарда

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Анотація. Зростання частоти ожиріння у популяції зумовлює потребу у створенні ефективних методів реабілітації постінфарктних хворих з надмірною вагою тіла. Метою дослідження було визначити, як ожиріння впливає на функціональне відновлення пацієнтів, що проходять реабілітацію після перенесеного гострого інфаркту міокарда. Були проаналізовані результати реабілітації хворих, що вперше у житті перенесли гострий інфаркт міокарда та перебували у стаціонарному відділенні інтенсивної терапії та реанімації кардіологічного профілю, отримуючи лікування відповідно до клінічних протоколів. Серед хворих були пацієнти з ожирінням I ступеня та з нормальною вагою тіла. Програма реабілітації тривала три місяці й включала фізичну активність, корекцію харчових звичок, психологічну підтримку та освітні заходи з профілактики серцево-судинних захворювань. Ефективність відновлення оцінювали за індексом маси тіла, функціональним станом міокарда, рівнем фізичної витривалості (тест 6-хвилинної ходьби) та якістю життя (SF-36). Результати дослідження засвідчили позитивний вплив реабілітаційних заходів на функціональне відновлення хворих. Водночас було підтверджено, що пацієнти з ожирінням мали менш виражене покращення якості життя ($r = 0,77$; $p < 0,05$), гіршу адаптацію до фізичних навантажень та повільніше відновлення гемодинамічних параметрів порівняно з хворими, які мали нормальну вагу. Виявлено, що надмірна маса тіла ускладнює процес реабілітації, знижує її ефективність та подовжує період відновлення. Це підтверджує доцільність персоналізованого підходу до реабілітації, що враховує ступінь серцевої недостатності, фізичну підготовку до захворювання та супутні патології. Отримані результати можуть бути використані для розробки індивідуальних реабілітаційних програм, спрямованих на підвищення ефективності лікування, зниження ризику ускладнень та покращення якості життя пацієнтів після інфаркту міокарда

Ключові слова: гострий коронарний синдром; серцева недостатність; індекс маси тіла; реабілітація; якість життя; толерантність до фізичного навантаження