

CARDIAC REHABILITATION OF PATIENTS FOLLOWING MYOCARDIAL INFARCTION

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Abstract

Myocardial infarction (MI) - represents cardiomyocytes necrosis due to prolonged myocardial ischemia, occurring in the context of an imbalance between myocardial oxygen supply and consumption. According to the National Bureau of Statistics, in 2017, mortality from cardiovascular diseases made up 58.4% of all deaths, of which ischemic heart disease (IHD) constituted 52.5% and 8.5% were due to acute myocardial infarction.

Cardiovascular rehabilitation is used to optimize the physical, psychological and social functioning of the patient who suffered a myocardial infarction. The session includes 3 phases: the warm-up, the actual training and the recovery (relaxation) phase. The program is individualized, so it is necessary to correctly select the type, intensity, duration and frequency for maximum therapeutic effect.

Exercise-based medical rehabilitation is a supplement to drug therapy and post-infarction interventional surgery, as it improves cardiopulmonary function, optimizes drug therapy, decreases risk factors, increases exercise tolerance, improves mental status, reduces the risk of repeated heart attack and cardiac mortality. There are fewer complications due to bed rest and increased performance as a result of improved hemodynamic and metabolic function. As part of a cardiac rehabilitation program, physical activity helps with psychological adaptation and contributes to a successful return to work.

Keywords: myocardial infarction, cardiovascular rehabilitation, physical exercises

Rezumat

Infarctul miocardic (IM) reprezintă necroza cardiomiocitelor cauzată de ischemia miocardică prelungită, apărută în contextul unui dezechilibru între aportul și consumul miocardic de oxigen. Conform Biroului Național de Statistică, în 2017 mortalitatea prin maladii cardiovasculare a reprezentat 58,4% din toate decesele, dintre care boala cardiacă ischemică (BCI) a constituit 52.5% și 8.5% au revenit infarctului miocardic acut.

Pentru a optimiza funcționarea fizică, psihologică și socială a pacientului după infarctul miocardic se folosește reabilitarea cardiovasculară.



INTERNAL MEDICINE

General Reviews

Sesiunea include 3 faze: încălzirea, antrenamentul propriu-zis și faza de revenire (relaxare). Programul este individualizat, astfel fiind necesar să se selecteze corect tipul, intensitatea, durata și frecvența, pentru efect terapeutic maximal.

Reabilitarea medicală bazată pe exerciții reprezintă un supliment pentru terapia medicamentoasă și chirurgia intervențională post-infarct, deoarece îmbunătățește funcția cardio-pulmonară, optimizează terapia medicamentoasă, scade factorii de risc, crește toleranța la efort, ameliorează starea psihică, reduce riscul de reinfarct și mortalitate cardiacă. Se produc mai puține complicații ca urmare a repausului la pat și se înregistrează creșterea performanței prin îmbunătățirea funcției hemodinamice și metabolice. Ca parte a unui program de reabilitare cardiacă, activitatea fizică ajută la adaptarea psihologică și contribuie la revenirea cu succes la activitatea profesională.

Cuvinte cheie: infarct miocardic, reabilitare cardiovasculară, exerciții fizice.

Introduction

Myocardial infarction (MI) - represents the necrosis of cardiomyocytes due to prolonged myocardial ischemia, occurring in the context of an imbalance between myocardial oxygen intake and consumption.

The incidence of MI is continuously increasing. In 2015, mortality from cardiovascular diseases (CVD) reached 17 million (31%) of the total of 54 million deaths worldwide, of which the share of coronary diseases constituted 48%.

Annually cardiovascular diseases cause 3.9 million (45%) deaths in Europe and over 1.8 million (37%) deaths in the European Union (EU). The global cost of CVD for the EU economy was estimated at 210 billion euro

per year, of this amount around 53% constituted the costs of the health care service, 26% came from lost productivity and 21% from "unofficial" care⁽²⁾.

Acute coronary syndrome (ACS) can be divided into subgroups of ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI).

The relative incidences of STEMI tend to decrease, and non-STEMI are increasing. The largest European registry of STEMI is found in Sweden, where the incidence of STEMI was 58 per 100,000 per year in 2015. In other European countries, the incidence rate was between 43 and 144 per 100,000 per year. Similarly, the adjusted incidence rates reported by the US decreased from 133 per

100,000 in 1999 to 50 per 100,000 in 2008, while the incidence of nonSTEMI remained constant or even increased slightly. There is a fairly clear tendency for STEMI to occur more frequently in the young than in the elderly, and equally more frequently in men than in women.

The mortality of patients with STEMI is influenced by multiple factors, among them advanced age, Killip class, delay in treatment, the existence of STEMI networks based on the emergency medical system, therapeutic strategy, the presence of antecedents of myocardial infarction, diabetes, renal insufficiency, the number of coronary arteries the ejection fraction of the left ventricle is also affected⁽³⁾. Although the incidence of MI is low in industrialized countries, partly due to improved health systems and the implementation of effective public health strategies, it is increasing in developing countries such as South Asia, parts of Latin America, and Eastern Europe⁽⁴⁾. The term "cardiac rehabilitation" refers to coordinated interventions aimed at optimizing the physical, psychological and social functioning of the cardiac patient, in addition to stabilizing, slowing or even reversing the progression of the underlying atherosclerotic processes, thereby reducing morbidity and mortality. The program involves education, exercise, risk factor modification, and counseling. It is targeted by specialized medical personnel and adapted to each individual. The recovery of patients with cardiovascular diseases has positive results because it improves exercise tolerance, thus leading to a decrease in mortality.

A meta-analysis based on a review of 48 randomized trials comparing the outcomes of exercise-based rehabilitation with usual care showed a 20% reduction in total mortality

and a 26% reduction in the cardiac death rate with exercise-based rehabilitation physical⁽⁵⁾. As a consequence, healthcare professionals have designed cardiac rehabilitation (CR) programs for patients with MI. RC generally consists of three phases:

- I - acute phase of CR after an acute event (1-14 days)
- II - Second phase of cardiac rehabilitation (1-6 months)
- III - The third (maintenance) phase of cardiac rehabilitation (6-12 months)⁽⁶⁾

RC aims at physical recovery, improvement of quality of life, psycho-social health and a decrease in the recurrence of hospitalization and death.

Aim of the study

Our aim was to study the influence of therapeutic physical exercise complexes used in the rehabilitation of patients with myocardial infarction to assess the beneficial effects on health.

Materials and methods

Articles and scientific publications from PubMed, Medscape databases, international guidelines and published national clinical protocols were used. For a more efficient study of the articles, the keywords used for the search were: cardiovascular rehabilitation, myocardial infarction, exercise. At the same time, in the electronic databases we used English and Romanian.

Results

Literature data suggest the importance of medical rehabilitation treatment for post-infarction patients in combination with



INTERNAL MEDICINE

General Reviews

pharmacological treatment. The session includes 3 phases: the warm-up, the actual training and the recovery (relaxation) phase. The program is individualized, so it is necessary to correctly select the type, intensity, duration and frequency for maximum therapeutic effect, periodically 3 to 5 sessions per week, with the recommended duration from 20 to 60 minutes. The criterion to dose physical effort is FCC⁽⁷⁾.

The warm-up period, which aims to increase myocardial blood supply, increase the flexibility of soft tissues, joint mobilization. The actual, supervised training is considered optimal with a duration of 20-30 minutes; it has been shown by numerous studies that the best results are obtained through anaerobic exercises that include repetitive movements and engage large muscle groups⁽⁸⁾.

The recovery period consists of performing low-intensity exercises and stretching; gradual recovery prevents the appearance of rhythm disturbances.

The beneficial effects are:

- Antiatherosclerotic, due to improving the lipid profile, increasing insulin sensitivity.
- Antiischemic - decreasing myocardial O₂ demand, increasing coronary flow.
- Antithrombotic - decrease in platelet aggregation, increase in fibrinolysis, decrease in fibrinogen, decrease in blood viscosity.

- Antiarrhythmic-increasing vagal tone, decreasing adrenergic activity^(9,10).

Conclusions

Exercise-based medical rehabilitation is a supplement to drug therapy and post-infarction interventional surgery, as it improves cardiopulmonary function, optimizes drug therapy, decreases risk factors, increases exercise tolerance, improves mental status, reduces the risk of reinfarction and cardiac mortality. Included are fewer complications due to bed rest and increased performance as a result of improved hemodynamic and metabolic function. As part of a cardiac rehabilitation program, physical activity helps reduce psychological maladjustment and contributes to a successful return to work.

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