

Case study

Cardiac Rehabilitation of The Coronary Artery Disease Patient: À Series Study.

M. Abdelbaki¹, A. Boureghda², N. Khellafi¹, A. El hachemi¹

¹Cardiology Department, EPH Mixte de Laghouat. ALGERIA.

²Cardiology Department, Blida University Hospital. ALGERIA.

Received: 05 September, 2023

Accepted: 08 October, 2023

Published: 14 October 2023

Abstract:

The cardiac rehabilitation is a part of coronary's therapy. This is a discordance between his advantage and his development, principally on the countries in development's way. There effects have a good report benefit/cost.

We collaborated with the departement of sports medecine who taked up this activity. We report our first expérience with 158 patients doing the ambulatory's phase.

The results showed an improvment in the functional's capacity, a better quality of life for all the patients.

Keywords: cardiac rehabilitation. Coronary's patients. Improvment functional. Quality of life.

Introduction:

Exercise in coronary heart disease (CHD) has been widely demonstrated in numerous studies [1,2]. The first studies showed an improvement equivalent to treatment with beta-blockers [3].

We propose to report on the experience of the first rehabilitation service for coronary heart disease patients in Algeria. This was a prospective study involving 158 patients undergoing outpatient rehabilitation.

The results showed an improvement in all patients in maximal exercise capacity, exercise tolerance and quality of life.

Materials and Methods:

This is a prospective study carried out in the cardiopulmonary rehabilitation department of the Laghouat mixed hospital, in collaboration with the EHS Maouche rehabilitation department in Algiers. It is part of the care chain for cardiovascular pathology set up by the hospital. Patients are referred by their cardiologists, who decide whether rehabilitation is appropriate. 158 patients were included: 148 were male, with an average age of 61 years, ranging from 45 to 76 years; 10 were female, with an average age of 62 years, ranging from 56 to 78 years (table 1).

Tableau1: population étudiée

| sexe | Age (ans) |
|------------|-------------------|
| 148 hommes | 45-76 moyenne 61 |
| 10 femmes | 56 -78 moyenne 62 |

Tableau 2: les sous groupes de coronariens

| Patients pontage | Patients angioplastie | Patients traités médicalement |
|------------------|-----------------------|-------------------------------|
| 98 | 45 | 15 |

There were 98 bridged patients, 45 stented patients and 15 medically treated patients (table2). The predominant risk factors in this population were hypertension, smoking, diabetes and dyslipidemia. Almost half had more than two associated risk factors. Operated and stented patients are recruited in phase II of cardiac rehabilitation, the ambulatory phase. The post-operative or post- interventional follow-up period averaged four weeks for all patients. A precise assessment of each patient [4] is carried out by a cardiologist: questioning, clinical examination, electrocardiogram, echocardiography and stress test to determine the level of risk [5]. The aim was to check for contraindications, such as pericarditis, tight aortic stenosis, heart failure, etc., but also to adapt exercise to the patient's severity. The patients in this study were all at low or intermediate risk (functional capacity between 5 and 6 METS). Patients undergoing medical treatment were those with stable, well-balanced angina on anti-anginal therapy.

The rehabilitation protocol used for each session comprises a 10-minute warm-up, 30 minutes of effective endurance exercise and a 10-minute cool-down.

The intensity of effort is determined on the basis of heart rate, as VO₂ max is not available. For each of them, it is calculated on the basis of a target heart rate to be reached for each patient:

target heart rate according to Karvonen's formula [6]= resting heart rate + 60% to 70%(max heart rate - resting heart rate) after an exercise test [7] carried out for each of them until the appearance of one of the following signs: shortness of breath (Borg scale), muscular fatigue, pallor, dizziness, chest pain, appearance of electrical signs of ischemia or rhythm disorders (most often ESV), and attainment of high blood pressure figures. All these causes require discontinuation.

Rehabilitation exercises [5] are performed on ergometers, under electrical monitoring by scopes. The team includes a cardiologist, a sports physician and two nurses. Blood pressure and heart rate are regularly recorded in a patient logbook. The sessions take place in the sports medicine department, with the cardiology department and cardiac intensive care unit nearby, and a defibrillator inside the room.

Each patient underwent an average of 20 rehabilitation sessions, at a rate of 3 sessions per week, under the supervision of the support team. Endurance effort was initially performed on an ergometer at 50% of max test power, then increments of 5W to 10W were achieved over the course of the sessions according to tolerance and ease of breathing (Borg 13), until the calculated threshold frequency was reached, generally between 60% and 80% FMT.

At the end of each patient's rehabilitation program, a stress test is carried out, with a new assessment by the cardiologist for each patient.

A questionnaire assessing quality of life after rehabilitation (satisfied, improved, useless, etc.) is given to each patient.

Result:

For the medical objectives we note:

*Maximal exercise capacity improved in 100% of patients between the start and end of the program (table3):

- in load from an average of 60W to an average of 92W, i.e. +53%.
- duration from 15mn to 40mn
- heart rate from 86b/mn to 135b/mn.

*A reduction in symptoms was observed in 100% of patients, most of them due to socio-cultural apprehension of physical exercise; in patients on medical treatment, the ischemic threshold was reduced: starting load: 45W, load at the end of the program: 92W.

Psychological objectives: according to the questionnaire, 100% of patients reported an improved quality of life, especially in terms of :

- the ability to carry out everyday activities,
- reduced anxiety, depression and stress
- renewed sexual activity

All patients have regained their self-confidence, and 90% have stopped taking sleeping pills.

In terms of social objectives, 85% of patients (126) were active.

At one year, almost 80%, i.e. 100 patients, had returned to work, some of them even before the end of the planned break. The average length of time off work was 105 days.

No major incidents occurred clinically or electrically [8]. Some minor incidents were reported: dizziness, fatigue, dyspnea... which disappeared after readjustment of the training frequency.

Tableau 3: résultat fonctionnel

| Patients | Charge | Fréquence cardiaque | Durée d'effort |
|------------------------------|-----------------|---------------------|----------------|
| Tous les patients | 60W-92W +53% | 86b/mn-136b/mn | 15mn-40mn |
| Patients pontage | 60W-90W +50% | 82b/mn-136b/mn | 10mn-40mn |
| Patients angioplastie | 75W-110W 47% | 84b/mn-143b/mn | 20mn-40mn |
| Patients traité médicalement | 45W-73W 62% | 88b/mn-133b/mn | 10mn-40mn |

Discussion:

The World Health Organization's [9] definition of cardiac rehabilitation is "the set of activities necessary to favorably influence the evolutionary process of the disease and to improve physical and mental condition in order to resume as normal an activity as possible in society." In the literature, all the major meta-analyses by Oldridge [1] (4,300 patients) and Oconnor [2] (22 trials) have highlighted all the objectives of rehabilitation: medical, psychological, social and public health; in particular, improvement in physical capacity, psychological state and return to work, leading to better social integration. This was found to be the case in our study. The reduction in morbidity and mortality noted in these two studies - 25% in the first and 20% in the second - is not highlighted in our study, as we consider that the number of patients and the follow-up period are still insufficient. Taylor's meta-analysis [10] of 8,900 patients also demonstrated this reduction in cardiac mortality. Initially, we encountered difficulties in getting patients to adhere to the program, due to their fear of physical exercise (as mentioned above), because of all that is conveyed in our society about heart disease (total invalidity due to damage to a mythical organ), and because of depression or anxiety (almost always postoperative, linked to the backlash of having outgrown danger and the need to "rethink" one's future). An interview with the patients to explain the program, its implementation under medical supervision and in a hospital environment, reassured them. As the sessions progressed, apprehension diminished as physical control and self-confidence returned [11]. This rehabilitation acted as a starter and prevented a regression in the patients' physical and mental capacities.

A study of the subgroups showed the greatest improvement in the maximum physical capacity of medically-treated patients [12], compared with the bridged and stented coronary artery disease groups, which started from the lowest effort level of 45W to reach a level of over 60%, 72W.

The group of coronary patients with angioplasty [5] improved their effort level the least, from 75W to 110W (47% more), which is not surprising given the higher starting point.

Moreover, this sub- group had no acute incidents or accidents. The group of coronary patients who underwent surgery showed an improvement in their psychological component, with a gain in self-confidence; this concerned 100% of these patients. This helped our patients to return to work [13] in less than a year for 75% of them.

In this patient population, we note that there are only ten women.

The number of female coronary patients is lower, representing only around a third of coronary patients, but it is above all the later onset of coronary disease (of the ten patients, seven are over 65 years of age) and the lack of physical exercise, which is more marked in our country, that are factors that contribute to the risk of coronary heart disease.

limiting. But it's also the reflex of cardiologists who don't refer patients considering that they have no activity outside the home (90% of them don't work). There's a real need to raise awareness, because very often they quickly lose their autonomy.

In our study, we didn't do any educational sessions on their risk factors, notably smoking, hypertension, diabetes and dyslipidemia, for two reasons: firstly, this was our first experience of cardiac rehabilitation, and the aim was to get it off the ground. The second is that we don't yet have a dietician or tobacco specialists. In the near future, we intend to launch these complementary activities for ourselves.

At the end of the rehabilitation program, we recommend that each patient follow up with physical exercise, usually by maintaining at least three jogging sessions a week or brisk walking, or for those who can, the purchase of an exercise bike. We reviewed all our patients three months after the end of their program, and all of them continued to exercise practically every day, having felt the benefits and wishing to maintain them.

Conclusions:

The evidence for the efficacy of cardiac rehabilitation in coronary artery disease is abundant and certain. It is an integral part of the long-term treatment of coronary disease. But this discipline still falls far short of what it should be, despite the various studies noting the improvement in morbimortality (evidence-based medicine). Some studies have even shown its value in stable angina, compared with angioplasty (PET study [14]), and in reducing risk factors (Euroaspire II study [15]).

It is in our country's great interest to develop these structures, which are less costly, and above all to think about using them to reduce risk factors, as we are currently in the midst of an epidemiological transition, with a progressive worsening of non-transmissible diseases, with cardiovascular disease at the top of the list.

Bibliography:


1. Oldridge N, Guyatt G, Fischer M, et al. Cardiac rehabilitation after myocardial infarction. Combined experience of clinical trials. *JAMA* 1988 ; 260 : 945-50.
2. O'Connor G, Buring J, Yusuf S, et al. An overview of randomized trials of rehabilitation with exercise after myocardial infarction. *Circulation* 1989 ; 80 : 234-44.

3. Todd IC, Ballantyne D. Antianginal efficacy of exercise training : a comparison with betablockade. *Br Heart J* 1990 ; 64 : 14-9.
4. Delahaye F, Bory M, Cohen A et al. Recommandations de la société française de cardiologie concernant la prise en charge de l'infarctus du myocarde après la phase aiguë. *Arch Mal Cœur* 2001; 94:696-7384
5. Monpère C, Sellier P, Meurin P, et al. Recommandations de la Société Française de Cardiologie concernant la pratique de la réadaptation cardiovasculaire chez l'adulte. Version 2 *Arch Mal Cœur* 2002; 95: 963-97.
6. Karvonen MJ, Kentala E, Mustala O. The effects of training on heart rate. A longitudinal study. *Ann Med Exp Biol* 1957; 35: 307-15.
7. Recommandations de la Société Française de Cardiologie concernant la pratique des épreuves d'effort chez l'adulte en cardiologie. *Arch Mal Cœur* 1997; 90: 77-92
8. Pavy B :Exercise training for cardiac patients : Result of french multicentric register of complications during cardiac rehabilitation. *Eur J Cardiovasc Prev Rehab* 2003;12(3):290-291
9. WHO. Report on needs and action priorities in cardiac rehabilitation and secondary prevention in patients with coronary artery disease. Two consultations. April 1992; Tours (F) July 1992. Geneva: WHO, 1993.
10. Taylor RS, Brown A et al. Exercise-based rehabilitation for patients with coronary heart disease: systemic review and meta-analysis of randomized controlled trials. *Am J Med* 2004;116: 682-92.
11. Denollet J, Brutsaert DL Enhancing emotional well-being by comprehensive rehabilitation in patients with coronary heart disease. *Eur Heart J*. 1995;16: 1070–1078
12. Manheim C, Camici P, Chester MR et al. The problem of chronic refractory Angina; report from the ESC Joint Study Group on the Treatment of Refractory Angina. *Eu Heart J* 2002; 23:335-70.
13. Monpere C, Rageolina A, vernochet P, Mirguet C, Thébaud N. Réinsertion professionnelle après réadaptation cardiovasculaire chez 128 patients coronariens suivis pendant sept ans. Résultats et réflexion médico-économique. *Arch Mal Cœur* 2000 ; 93 :797-806.
14. Hambrecht R, Walther C, Möbius S, et al. Percutaneous coronary angioplasty compared with exercise training in patients with stable coronary artery disease. A randomized trial. *Circulation* 2004; 109: 1371-8.
15. Euroaspire study group. Lifestyle and risk factor management and use of drug therapies in coronary patients from 15 countries. Principal results from euroaspire II. *Euro Heart Survey Programme Eur Heart Journal* 2001; 22:554-72.
16. Dorn J, Naughton J, Imamura D, et al. Results of a multicenter randomized clinical trial of exercise and long term survival in myocardial infarction patients. The National Exercise and Heart Disease Project (NEHDP). *Circulation* 1999 ; 100 : 1764-9.
17. Belardinelli R, Paolini I, Cianci G, et al. Exercise training intervention after coronary angioplasty. *J Am Coll Cardiol*

- 2001 ; 37 : 1891-900.
18. Wanamethee SG, Shaper AG, Walker MA. Physical activity and mortality in older men with diagnosed coronary heart disease. *Circulation* 2000; 102: 1358-63.
 19. Keley G. Antihypertensive effects of aerobic exercise; a brief meta-analytic review of randomized controlled trials. *Am J Hypertens* 1994; 7: 115-9.
 20. Engblom E, Hietanen EK, Hamalainen H, Kallio V, Inberg M, Knurs LR. Exercise habits and physical performance during comprehensive rehabilitation after coronary artery bypass surgery. *Eur Heart J* 1992; 13: 1053-1059
 21. Broustet JP, Monpere P et groupe de travail « réadaptation cardiaque et épreuve d'effort » de la SFC, Enquête

coopérative sur les suites de la chirurgie cardiaque au cours de la réadaptation cardiaque *Arch. Mal Cœur*; 1994 ; 87 :1267

Copyright (c) 2023 The copyright to the submitted manuscript is held by the Author, who grants the Clinical Medicine and Health Research Journal a nonexclusive license to use, reproduce, and distribute the work, including for commercial purposes.

 This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)