

THE UNDERUTILIZATION OF CARDIAC REHABILITATION: HIGHLIGHTS FROM THE 2018 ESC CONGRESS

MARCO AMBROSETTI, MD

Author affiliations: *Istituti Clinici Scientifici Maugeri, Care and Research Institute, Department of Cardiac Rehabilitation, Pavia, Italy*

Address for correspondence: *Marco Ambrosetti, MD, Istituti Clinici Scientifici Maugeri, Care and Research Institute, Department of Cardiac Rehabilitation, Via S. Maugeri, 4, 27100 Pavia, Italy (email: marco.ambrosetti@icsmaugeri.it)*

Keywords: *adherence; cardiac rehabilitation; referral*

In August 2018, an accompanying editorial in the current issue of the *European Journal of Preventive Cardiology*, affiliated with the ESC, evoked the figure of a “bottleneck” to describe a phenomenon that is very familiar to the cardiac rehabilitation community: after a myocardial infarction, all patients have an indication for cardiac rehabilitation, but only very few benefit from an adequate program.¹ Together with reduced patient adherence and the eventuality of suboptimal cardiac rehabilitation protocols, lack of systematic referral represents the main reason for the “cardiac rehabilitation bottleneck,” and similar consideration might be applied to other target groups for cardiac rehabilitation as well (ie, chronic heart failure or peripheral arterial disease). In the same month, more than 30 000 cardiologists attended the 2018 ESC congress in Munich, and the problem about underutilization of cardiac rehabilitation has been extensively discussed, with further support provided by growing evidence.

REFERRAL TO AND PARTICIPATION IN CARDIAC REHABILITATION PROGRAMS

First, data from the EUROASPIRE IV survey confirmed the problematic situation of cardiac rehabilitation across Europe, where only about half of the patients with coronary artery disease are currently advised to participate in a cardiac rehabilitation program, and, among those advised, about 20% do not attend.² This picture has not significantly improved during the last 10 years, since similar rates were found in the previous EUROASPIRE III survey published in 2009. The fourth EUROASPIRE study included 7998 patients in 78 hospital centers in 24 European countries, who underwent either elective or emergency coronary artery bypass graft surgery or percutaneous coronary intervention, and were interviewed after 6 months to 3 years. The main results of the survey concerning the achievement of therapeutic and lifestyle targets were published in 2016, but only recently was information about referral to cardiac rehabilitation programs and related adherence made available. Indeed, now we know a little more than the crude (unsatisfactory)

referral rate to cardiac rehabilitation programs. For example, we know that older patients, women, those with a low educational level, and those with heart failure, hypertension, or diabetes are at the highest risk to not be advised about the importance of a cardiac rehabilitation program.

Furthermore, we know that entering in a cardiac rehabilitation program does not provide a guarantee of success *per se*, as about one-fifth of patients usually miss at least half of the sessions, with wide heterogeneity among different European countries. Smokers and patients with a low education level represent a particularly vulnerable cluster in terms of nonadherence and, consequently, they may be considered for targeted interventions. These results give more emphasis to the recently described socio-ecological health model that identifies 63 factors associated with nonparticipation in and/or dropouts of cardiac rehabilitation programs that are divided into six categories: intrapersonal factors, clinical factors, interpersonal factors, logistical factors, cardiac rehabilitation program factors, and health system factors.³ Focusing on how to achieve systematic referral of all eligible patients and how to decrease the nonparticipation and dropout rates, there is probably a need for taking greater account of the geographical access: more availability of cardiac rehabilitation sites closer to home, the delivery of home-based or community-based programs, the consideration of economic incentives or transport facilitations for those participants with low socioeconomic status, may represent examples of concrete actions, which would be better if coupled to an automatic referral process and supported by digital health tools.

However, EUROASPIRE IV was not the only source of evidence presented at the 2018 ESC congress to help identify “who is” the patient who generally does not attend cardiac rehabilitation programs. The SWEDEHEART registry included 31297 patients with myocardial infarction, mean age 62.4±4 years, during the time period between 2010 and 2016.⁴ Nonattenders of cardiac rehabilitation programs were older, more often retired, had more previous disease (diabetes, heart failure, stroke), higher body mass index, reduced left ventricular function, and were more often smokers at baseline than attenders. Interestingly, sex was not associated with nonattendance, and the strongest predictors of nonattendance were smoking, type of hospital (country hospital vs university hospital), occupational status (sick leave vs employed), and previous disease in terms of surgical or percutaneous revascularization. The latter point particularly reflects the importance of the patient’s diagnosis on physician recommendation: in the current scenario, patients who have received coronary artery bypass graft intervention (or other types of cardiac surgery) have higher probabilities of participating in cardiac rehabilitation programs, but there is a need to increase the awareness of the benefits derived from cardiac rehabilitation in other cardiac conditions.

ADHERENCE TO CARDIAC REHABILITATION PROGRAMS

Moving from referral to adherence, an Australian administrative database of 3350 patients enrolled in outpatient cardiac rehabilitation programs between 2007 and 2017 found that dropouts occurred more frequently among younger subjects, people with higher depression/anxiety/stress levels, lower overall quality of life, and in case of delayed tracks to the cardiac rehabilitation facility. Adults who were divorced, diabetic, current smokers, heavy drinkers, or who had a sedentary lifestyle were also significantly more likely to drop out of cardiac rehabilitation programs. On the other hand, almost like a “loyalty bonus,” those who did not drop out of cardiac rehabilitation had a significant reduction in depression and anxiety scores on completion, and this could represent a way to promote adherence to the whole program.

Then, a reappraisal of “referral to cardiac rehabilitation programs” as a strong predictor of prognosis in cardiovascular patients was also supported by several studies presented at the 2018 ESC congress. As an example, the AMIS Plus Registry from Switzerland analyzed the impact of direct cardiac rehabilitation referral at hospital discharge on 1-year outcomes after a myocardial infarction.⁶ Data was collected between 2005 and 2016 in 10 141 patients referred to home cardiac rehabilitation or to cardiac rehabilitation centers: the main result was that the cardiac rehabilitation group received more immediate treatment and more secondary prevention medication, as shown by a lower 1-year mortality (OR, 0.65; 95% CI, 0.48-0.88), even after adjusting for confounders, without differences for outpatients vs inpatients. Further evidence, in the field of chronic heart failure, came from a population study on incident cases observed from 2005 to 2012 in the Lombardy region of Italy.⁷ This study analyzed the impact of residential cardiac rehabilitation programs on all-cause mortality and readmissions, and data was collected by the regional health care system administrative database: interestingly, patients experienced a mean of 3.26 ± 1.78 admissions in acute wards before they were referred to a cardiac rehabilitation facility, thus suggesting a delayed referral process even in more complicated cases. Above all, patients actively referred to cardiac rehabilitation programs showed a 43% decrease in mortality after adjusting for different covariates and a 31% reduction in the risk of readmission. As a remark, the importance of this study not only refers to the proven beneficial relationship between the use of cardiac rehabilitation and patient survival, but also to the identification of potential savings for health care organizations, since readmissions constitute major expenditures during the care process of patients with heart failure.

“STATE OF THE ART” OF THE UNDERUTILIZATION OF CARDIAC REHABILITATION

Apart from conventional studies and registries, the 2018 ESC congress offered several occasions to speculate about the “state of the art” of the underutilization of

cardiac rehabilitation. This was opportunely the title of a lecture given by Heinz Voeller (DE), Chairman of the Secondary Prevention and Rehabilitation Section of the European Association of Preventive Cardiology, who emphasized how cardiac rehabilitation is able to maintain efficacy in terms of improved functional capacity, increased use of cardioprotective medications, and better prognosis even now in the modern era of revascularization strategies. Nevertheless, this depends on mechanisms by which cardiac rehabilitation may work, and the following three are not negligible: cardiac rehabilitation referral from an inpatient setting, cardiac rehabilitation referral from an outpatient setting, and cardiac rehabilitation adherence.⁸ If appropriately considered and managed by general cardiologists and the whole cardiac rehabilitation community, these measures seem reasonable to overcome the cardiac rehabilitation bottleneck, which may contribute to a reduction in the impact of cardiovascular diseases. ■

REFERENCES

1. Pastormerlo LE, Aimo A, Piepoli F, Emdin M. The bottleneck of cardiac rehabilitation for patients with coronary artery disease: how to overcome. *Eur J Prev Cardiol.* 2018;25(12):1239-1241.
2. Kotseva K, Wood D, De Backer G; EUROASPIRE Investigators. Determinants of participation and risk factor control in coronary patients attending cardiac rehabilitation programmes: results from the EUROASPIRE IV survey. *Eur J Prev Cardiol.* 2018;25:1242-1251.
3. Resurrección DM, Moreno-Peral P, Gómez-Herranz M, et al. Factors associated with non-participation in and dropout from cardiac rehabilitation programmes: a systematic review of prospective cohort studies. *Eur J Cardiovasc Nurs.* 2018 Jun 1. Epub ahead of print.
4. Back M, Borg S, Leosdottir M, et al. Factors associated with non-attendance at exercise-based cardiac rehabilitation. *Eur Heart J.* 2018;39(suppl):4.
5. Rao A, Zecchin R, Newton PJ, et al. Who drops out of cardiac rehabilitation programs (2007-2017)? *Eur Heart J.* 2018;39(suppl):1122.
6. Hermann M, Witassek F, Erne P, et al. Referral for cardiac rehabilitation after acute myocardial infarction: insights from nationwide AMIS Plus registry 2005-2017. *Int J Cardiol.* 2018;261:1-5.
7. Scalvini S, Grossetti F, Paganoni AM, et al. Cardiac rehabilitation referral in Lombardy region: a population study on incident cases from 2005 to 2012. *Eur Heart J.* 2018;39(suppl):1261.
8. Thomas RJ, Balady G, Banka G, et al. 2018 ACC/AHA clinical performance and quality measures for cardiac rehabilitation. *Circ Cardiovasc Qual Outcomes.* 2018;11(4):e000037.