



Cardiac Rehabilitation after Coronary Artery Bypass Graft Surgery: Urgently Needed!

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Coronary artery bypass graft surgery has proven effective in relieving anginal symptoms and prolonging survival in many subsets of coronary artery disease patients [1]. This finding has led to the extensive application of this procedure in recent years. In Israel the annual number of CABG-treated patients is approximately 5,500. However, the above benefits of CABG are not paralleled by the expected beneficial effect in other quality-of-life domains, including aspects of both physical and psychosocial well being. Employment rates in surgically treated patients are disappointing in that they do not exceed those in patients treated medically [2-6] and generally are not higher than rates after an acute myocardial infarction. Post-CABG employment status has not substantially improved over the past decades despite the improvement in surgical techniques. Many post-CABG patients suffer from bodily pain, usually of a musculoskeletal nature, that they often tend to attribute to cardiac origin.

Anxiety and depression are frequently encountered in post-CABG patients [1]. Anxiety may enhance sympathetic nervous system activity and complicate patient care. The prevalence of depression is about 33% [7], similar to that in post-myocardial infarction patients. Depression may complicate physical and psychosocial recovery and is also a documented risk factor for recurrent cardiac events [8,9]. Thus, the realization of one's mortality, physical limitations, limitations of sexual and vocational activities, and the development of nihilism regarding the modification of risk factors may adversely affect recovery. Neurocognitive sequelae of the operation may also impair quality of life.

In addition, the benefit of CABG with regard to both symptom relief and mortality decreases over the long term (10 years) due to the progression of graft and native coronary atherosclerosis [1]. Therefore, there is a need for intensive efforts to screen for and treat coronary artery disease risk

factors in post-CABG patients [1,10,11]. All smokers should receive educational counseling and be offered smoking cessation therapy after CABG [1]. Also indicated are aggressive lipid-lowering therapy, control of high blood pressure and body weight, and regular physical activity [1,10].

The participation of post-CABG patients in a comprehensive cardiac rehabilitation program may be the appropriate response to the above mentioned issues. Such programs consist of physical exercise together with education, counseling and behavior-modification strategies aimed at reducing coronary disease risk factors and modifying lifestyle and health-related behaviors [10]. Extensive research [10] points to the beneficial effects of cardiac rehabilitation on exercise tolerance, symptoms of angina and heart failure, blood lipid levels, carbohydrate and insulin metabolism, body weight and blood pressure control, psychological well being, psychosocial functioning and rate of progression of coronary atherosclerosis, as well as on mortality rates. Studies have reported a 25% reduction in mortality following participation in a cardiac rehabilitation program [10,12,13]. Improved endothelial function is an additional potential benefit of cardiac rehabilitation [14].

The cost-effectiveness of cardiac rehabilitation services is also well documented [10,15]. During a 3 year follow-up of an American patient sample after coronary events, 58% of which were CABG operations, per capita hospitalization charges were \$739 lower for rehabilitated patients than for non-participants [15]. The cost-effectiveness of cardiac rehabilitation stems from both a decrease in healthcare utilization costs (recurrent hospitalizations, invasive procedures and physician and emergency room referrals) and an increase in productive employment.

Current practice guidelines [1,16] encourage participation of post-CABG patients in such programs. Recent American College of Cardiology/American Heart Association guidelines for CABG surgery [1] emphasized that "cardiac rehabilitation should be offered to all eligible patients after coronary bypass surgery."

CABG = coronary artery bypass grafting

In Israel, the participation of post-CABG patients in a cardiac rehabilitation program is not only a recommendation of experts in the field, but also one of the medical services for which these patients are legally eligible. However, surveys of cardiac rehabilitation services in Israel that were conducted in 1996 [17] and 1998 show that the actual number of post-CABG patients who participated in a cardiac rehabilitation program was very low, 5–7%.

In this issue of *IMAJ*, Simchen and colleagues [18] demonstrate the benefits that post-CABG patients derive from participation in a phase II cardiac rehabilitation program for health-related quality of life and social functioning. Their study was based on a unique patient sample: all 45–64 year old one year survivors after CABG in Israel in 1994 (n=2,085). A very low percentage (6.9%) of these patients participated in such a program, and their responses to generic (SF-36) and specific health-related quality of life questionnaires were compared with those of a control group of non-rehabilitated patients matched for age, gender, and time of answering the questionnaire. Compared to the controls, the rehabilitated patients achieved significantly higher scores in several domains of the generic quality of life questionnaire: general health, physical functioning, and social functioning. The rehabilitated patients also reported significantly better overall functioning, higher satisfaction with medical care, and a higher rate of employment. The authors refer to the extremely low participation rate in cardiac rehabilitation, which they attribute mainly to the lack of recommendation by cardiac surgeons. According to Simchen et al. [18], many patients are referred to cardiac rehabilitation programs following a recommendation from friends or relatives who participated in such programs. The authors emphasize the need for a healthcare policy that encourages the routine referral of post-CABG patients to cardiac rehabilitation programs.

As indicated by the authors, the limitations of their study [18] are the lack of randomization and their use of a sample of patients who referred themselves for cardiac rehabilitation. Therefore, the difference in health-related quality of life between the two groups of patients could be attributed to factors *unrelated* to participation in a cardiac rehabilitation program. However, their findings are consistent with those of a Finnish study [19] that was based on the randomization of post-CABG patients to a standard care group (n=109) or a standard care plus rehabilitation group (n=119). Rehabilitated patients reported better physical mobility, better perceived health, better perceived overall life conditions, and better occupational status compared to controls.

An understanding of the factors that contribute to this low participation rate is of extreme importance for planning and implementing measures to increase participation. These factors may be divided into the following three major categories:

The healthcare system – e.g., the reluctance of agencies providing healthcare to refer patients and to finance their participation in cardiac rehabilitation programs, the lack of such programs in many parts of Israel, and the low rate of

recommendation for such programs by cardiac surgeons, cardiologists, internists and primary care physicians.

The cardiac rehabilitation program – aspects of which may be an obstacle to patients' participation, e.g., inconvenient time schedule, distance from home, incongruence between program components and individual needs.

Patients' characteristics – e.g., lack of awareness regarding cardiac rehabilitation services and their potential to contribute to their physical and psychosocial well being, inability to participate in the program due to long working hours or multiple social roles, low socioeconomic status, lack of financial coverage by health insurance, transportation difficulties, and concomitant medical problems that may interfere with participation.

It is clear that action should be taken to overcome the above obstacles. The Ministry of Health Committee on "Cardiac Rehabilitation – Policy and Application" recently issued recommendations that include post-CABG patients among the high priority patient groups. Adopting these recommendations is a step in the right direction. The committee recommended the following:

- Improvement of the availability of cardiac rehabilitation services by more efficient utilization of the existent facilities throughout the day and by opening new centers for cardiac rehabilitation.
- Improvement of the referral system for outpatient cardiac rehabilitation services by the appointment of a cardiac rehabilitation nurse coordinator in each medical center and in the community. The Committee also stressed that the discharge documents administered by the cardiac surgery departments and the medical letters from cardiac units should contain clear recommendations for cardiac rehabilitation.
- Facilitation of early rehabilitation programs, including phase I (during hospitalization) programs and programs at convalescence centers.
- Initiation of measures for increasing the awareness among healthcare providers, physicians, other health professionals, patients and their families, as well as the general public, of the importance of cardiac rehabilitation programs.

In spite of the many obstacles that stand in the way of cardiac rehabilitation as a standard procedure for cardiac patients, there seems to be a growing acceptance among both patients and physicians of the long-term medical and psychosocial benefits of rehabilitation programs. The study by Simchen et al. is certainly an important contribution to this trend that will hopefully lead to a greater appreciation and understanding of this important field.

References

1. Eagle KA, Guyton RA, Davidoff R, Ewy GA, Fonger J, Gardner TJ, Gott JP, Herrmann HC, Marlow RA, Nugent WC, O'Connor GT, Orszulak TA, Rieselbach RE, Winters WL, Yusuf S. ACC/AHA guidelines for coronary artery bypass graft surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee

- to Revise the 1991 Guidelines for Coronary Artery Bypass Graft Surgery). *J Am Coll Cardiol* 1999;34:1262-346.
2. Mark DB, Lam LC, Lee KL, Jones RH, Pryor DB, Stack RS, Williams RB, Clapp-Channing NE, Califf RM, Hlatky MA. Effects of coronary angioplasty, coronary bypass surgery, and medical therapy on employment in patients with coronary artery disease: a prospective comparison study. *Ann Intern Med* 1994;120:111-17.
 3. Anderson AJ, Barboriak JJ, Hoffmann RG, Mullen DC. Retention or resumption of employment after aortocoronary bypass operations. *JAMA* 1980;243:543-5.
 4. Barnes GK, Ray MJ, Oberman A, Kouchoukos NT. Changes in working status of patients following coronary bypass surgery. *JAMA* 1977; 238:1259-62.
 5. Boulay FM, David PP, Bourassa MG. Strategies for improving the work status of patients following coronary artery bypass surgery. *Circulation* 1982;66(Suppl III):43-9.
 6. Smith HC, Hammes LN, Gupta S, Vlietstra RE, Elveback L. Employment status after coronary artery bypass surgery. *Circulation* 1982;65:120-5.
 7. McKhann GM, Borowicz LM, Goldsborough MA, Enger C, Selnes OA. Depression and cognitive decline after coronary artery bypass grafting. *Lancet* 1997;349:1282-4.
 8. Levine JB, Covino NA, Slack WV, Safran C, Safran DB, Boro JE, Davis RB, Buchanan GM, Gervino EV. Psychological predictors of subsequent medical care among patients hospitalized with cardiac disease. *J Cardiopulm Rehabil* 1996;16:109-16.
 9. Perski A, Feleke E, Anderson G, Samad BA, Westerlund H, Ericsson CG, Rehnqvist N. Emotional stress before coronary bypass grafting limits the benefits of surgery. *Am Heart J* 1998;136:510-17.
 10. Wenger NK, Froelicher ES, Smith LK, Ades PA, Berra K, Blumenthal JA, Certo CME, Dattilo AM, Davis D, DeBusk RF, Drozda JP Jr, Fletcher BJ, Franklin BA, Gaston H, Greenland P, McBride PE, McGregor CGA, Oldridge NB, Piscatella JC, Rogers FJ. Cardiac Rehabilitation. Clinical Practice Guideline No.17. Rockville, MD: US Department of Health and Human Services. Public Health Service. Agency for Health Care Policy and Research and the National Heart, Lung and Blood Institute. AHCPR Publication No 96-0672. October 1995.
 11. Haskell WL, Alderman EL, Fair JM, Maron DJ, Mackey SF, Superko HR, Williams PT, Johnstone IM, Champagne ME, Krauss RM, Farquhar JW. Effects of intensive multiple risk factor reduction on coronary atherosclerosis and clinical cardiac events in men and women with coronary artery disease: The Stanford Coronary Risk Intervention Project (SCRIP). *Circulation* 1994;89:975-90.
 12. O'Connor GT, Buring JE, Yusuf S, Goldhaber SZ, Olmstead EM, Paffenbarger RS Jr, Hennekens CH. An overview of randomized trials of rehabilitation with exercise after myocardial infarction. *Circulation* 1989;80:234-44.
 13. Oldridge NB, Guyatt GH, Fischer ME, Rimm AA. Cardiac rehabilitation after myocardial infarction: combined experience of randomized clinical trials. *JAMA* 1988;260:945-50.
 14. Hambrecht R, Wolf A, Gielen S, Linke A, Hofer J, Erbs S, Schoene N, Schuler G. Effect of exercise on coronary endothelial function in patients with coronary artery disease. *N Engl J Med* 2000;342:454-60.
 15. Ades PA, Huang D, Weaver SO. Cardiac rehabilitation participation predicts lower rehospitalization costs. *Am Heart J* 1992;123:916-21.
 16. Drory Y, Marom-Klibansky R, Pardo Y, Klein Y, Scheinowitz M. Working Group on Cardiac Rehabilitation, Israel Heart Society. Position Statement on: Cardiac Rehabilitation in Israel. Ramat Gan, Israel: Israel Medical Association, The Scientific Committee, Quality Assurance Department, 2000:1-47.
 17. Drory Y. Cardiac rehabilitation. *Harefuah* 1997;133:291-6 (Hebrew).
 18. Simchen E, Naveh I, Zitser-Gurevich Y, Brown D, Galai N, for the IS CAB consortium. Is participation in cardiac rehabilitation programs associated with better quality of life and return to work after coronary artery bypass operations? The Israeli CABG Study. *IMAJ* 2001;3:399-403.
 19. Engblom E, Korpilahti K, Hamalainen H, Ronnema T, Puukka P. Quality of life and return to work 5 years after coronary artery bypass surgery: long-term results of cardiac rehabilitation. *J Cardiopulm Rehabil* 1997;17:29-36.
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