Return to Full Normal Activities Including Work at Two Weeks After Acute Myocardial Infarction

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Patients are generally advised to return to full normal activities, including work, 6 to 8 weeks after acute myocardial infarction (AMI). We assessed the outcomes of early return to normal activities, including work at 2 weeks, after AMI in patients who were stratified to be at a low risk for future cardiac events. Patients were considered for randomization before discharge if they had no angina, had left ventricular ejection fraction >40%, a negative result from a symptom-limited exercise stress test for ischemia (<2 mm ST depression) at 1 week, and achieved >7 METs. Patients with left ventricular ejection fraction <40% were included only if they did not have inducible ventricular tachycardia at electrophysiologic studies. Seventy-two patients were randomized to return to normal activities at 2 weeks and 70 patients to undergo standard cardiac rehabilitation and return to normal activities at 6 weeks after AMI. There were no deaths or heart failure in either group. There was no significant difference in the incidence of reinfarction, revascularization, left ventricular function, lipids, body mass index, smoking, or exercise test results at 6 months. In conclusion, return to full normal activities, including work at 2 weeks, after AMI appears to be safe in patients who are stratified to a low-risk group. This should have significant medical and socioeconomic implications. **(Am J Cardiol 2006;97:952–958)**

In the era of reperfusion, management of patients with myocardial infarction has been rapidly changing, where patients who are considered to be at low risk are being discharged from hospitals sooner and returning to work sooner.[1] In previous studies, patients who were considered to be at low risk returned to work at about 6 to 8 weeks after myocardial infarction.[1–3] Return to work sooner than 8 weeks after an acute myocardial infarction (AMI) is usually not recommended, mainly because of concerns regarding getting patients back to their preinfarction activities before the infarct is completely healed. Detailed clinicopathologic work has demonstrated that small infarcts are almost completely healed after 5 weeks and large infarcts are completely healed or undergo no further discernible change after 2 months.[4] We evaluated whether there was increased risk of patients returning to all their normal activities, including work, at 2 weeks after an AMI, provided they were considered to be at a low risk for future cardiac events. We previously noted that early return to normal activities in this cohort is cost effective.[5]

Methods

The trial was approved by the ethics committee of the Western Sydney Area Health Service (Sydney, Australia). Informed consent was obtained from all patients before inclusion in the trial.

Inclusion criteria: The protocol was described previously when the economic evaluation of this trial was published.[5]

Patients were considered for inclusion in the trial if they had an AMI and were <75 years of age (Figure 1). Management of AMI consisted of thrombolysis for patients with ST-elevation AMI unless there were contraindications. All patients were routinely commenced on 150 mg/day of aspirin unless there were contraindications. Beta blockers, angiotensin-converting enzyme inhibitors, and cholesterol-lowering agents were used at the discretion of the treating cardiologist. All patients received education and counseling from medical and nursing staff during their hospital stay and they attended 3 lecture and discussion sessions about risk factor modification, optimum diet, and medications.

If patients remained free of angina and heart failure in the hospital, they had a gated heart pool scan (GHPS) and a

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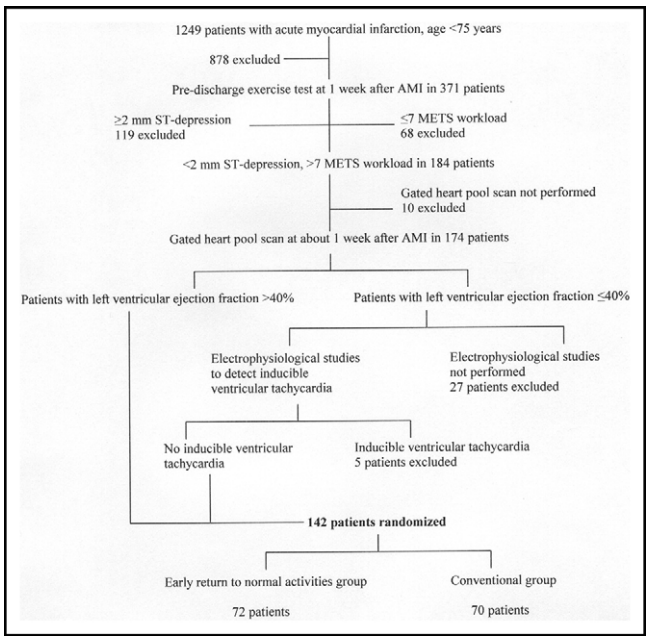

Figure 1. Inclusion criteria.

predischarge symptom- and sign-limited exercise test using Bruce's protocol at 1 week after AMI. The value and safety of a predischarge symptom-limited exercise test have been previously described.[6–8] The exercise test was considered positive for ischemia if there was ≥2-mm ST-segment depression with exercise.[1,9,10] The exercise test was considered indicative of ischemia or poor ventricular function if ≤7 METs workload was attained.[11] Patients were considered for inclusion only if there was <2-mm ST-segment depression with exercise and if they attained >7-METs workload.[12] Patients were excluded if there was ≥2-mm ST-segment depression with exercise or if ≤7-METS workload was attained.

In addition, patients were required to have a left ventricular ejection fraction >40% as determined with a GHPS to be included in the trial (Figure 1). If left ventricular ejection fraction was ≤40%, patients could have electrophysiologic studies; if there was no inducible ventricular tachycardia (cycle length >230 ms), they were eligible to be included in the trial. Patients who have no inducible ventricular tachyarrhythmia at electrophysiologic studies and <2-mm ST-segment depression on exercise testing have only a 1% 1-year mortality after AMI.[9] Patients with inducible sustained monomorphic ventricular tachycardia with a cycle length >230 ms (<260 beats/min) after an AMI have a 27% to 46% chance of spontaneous ventricular tachyarrhythmia over 1 to 2 years.[9,13]

All values are means ± SDs or percentages of the total.

Patients: Consecutive patients who were admitted to Westmead Hospital and nearby Blacktown Hospital were considered for the trial. During the trial period 1,249 patients who were <75 years of age were screened (Figure 1). Eight hundred seventy-eight patients were excluded before the predischarge exercise test. Reasons for exclusion were angina in 418 patients; heart failure in 113; inability to participate in exercise test because of problems, such as arthritis, peripheral vascular disease, or chronic lung disease in 78; refusal to participate in the trial in 48; not referred for inclusion in the trial or delayed referral in 45; living too far away to participate in the cardiac rehabilitation program in 42; other medical problems that caused an extended hospital stay (>12 days) in 40; death in the hospital in 38; left bundle branch block (making it difficult to assess ischemia during the exercise test) in 24; surgical revascularization in 15; exercise test not performed in 10; and early discharge by a patient against medical advice in 7. Predischarge exercise tests were performed in 371 patients. Of these, 142 patients were eligible for and agreed to be in the trial (Figure 1).

Seventy patients were randomized to undergo the standard cardiac rehabilitation program and return to full normal activities, including work at 6 weeks after AMI (conventional treatment group). The 5-week rehabilitation program consisted of exercise, education, and counseling sessions that were held 2 to 4 times per week at the cardiac rehabilitation unit of Westmead Hospital. Seventy-two patients were randomized to return to full normal activities, including work at 2 weeks, after AMI without a formal rehabilitation program (early return to normal activities [ERNA] group). This group of patients was contacted over the telephone by the nurse coordinator once per week for 5 weeks. The 2 groups of patients were encouraged to exercise at home on a regular basis. Patients were given the telephone numbers of the cardiologist and the nurse coordinator so they could be contacted in case of problems.

Outcome measurements: The primary end point was return to normal activities. Secondary end points were left ventricular ejection fraction, reinfarction, serum cholesterol, body mass index, smoking, exercise, coronary angioplasty, and coronary artery bypass grafting.

Statistical analysis: Analysis was performed on an intention-to-treat basis. To assess changes of variables from 0 to 6 months, a within-patient analysis was performed.

Sample calculation: Assuming the rates of return to work are 70% in the conventional group and 85% in the ERNA group, a total sample of 268 patients would be needed when using a significance level of 0.05 and power of 0.80.

Randomization schedules were generated by an independent investigator and were kept in opaque sealed envelopes. These envelopes were opened by the nurse coordinator only at randomization of a patient. The allocation sequence was not available to the nurse coordinator or any of the trial investigators or the clinical staff in the hospital. The trial was not blinded.

Prospectively defined stopping rules: It was considered reasonable to terminate the study prematurely if there was a moderate suggestion of an increased rate of adverse events. A 2-sided confidence limit of 0.9 was considered

Table 1
Clinical characteristics at randomization

Variable	ERNA Group (n = 72)	Conventional Group (n = 70)	p Value
Age (yrs)	55.8 ± 11.5	56.2 ± 10.2	0.96
Men	62 (86%)	62 (89%)	0.66
Married	55 (77%)	54 (77%)	0.77
Body mass index (kg/m^2)	27.9 ± 3.8	27.8 ± 5	0.7
Current smoker	33 (46%)	29 (41%)	0.85
No. of cigarettes smoked per day	27.5 ± 15	26.1 ± 18.3	0.48
Hypertension	28 (39%)	24 (34%)	0.52
Diabetes mellitus	8 (11%)	11 (16%)	0.42
Previous myocardial infarction	7 (10%)	2 (3%)	0.14
Family history of ischemic heart disease	40 (56%)	35 (50%)	0.51
Total cholesterol			
mmol	5.9 ± 1.1	5.9 ± 1.2	0.79
mg/dl	228 ± 43	228 ± 46	
Triglycerides			
mmol	2.5 ± 2.3	2.3 ± 1.4	0.37
mg/dl	221 ± 204	204 ± 124	
Hours (per week) of exercise before AMI	1.8 ± 2.8	1.3 ± 1.9	0.46
Site of myocardial infarction			
Anterior	24%	17%	0.89
Inferior	48%	55%	—
Q-wave myocardial infarction	51%	59%	0.4
Thrombolysis	62%	66%	0.64
Left ventricular ejection fraction (%)	56.7 ± 7.6	56.8 ± 8.9	0.4

Table 2
Variables recorded during exercise testing

	ERNA Group	Conventional Group	p Value
At randomization			
No. of patients	72	70	—
METs attained during exercise	10.1 ± 2.3	10.0 ± 2.4	0.61
Pressure-rate product	219 ± 63	227 ± 56	0.39
ST-segment depression with exercise			
0–0.9 mm	46 (64%)	55 (78%)	0.5
1.0–1.9 mm	26 (36%)	15 (22%)	—
At 6 weeks			
No. of patients	62	60	
METS attained during exercise	11.3 ± 3	14.4 ± 13.8	0.015
Pressure-rate product	241 ± 77	232 ± 56	0.38
ST-segment depression with exercise			
0–0.9 mm	32 (52%)	38 (63%)	0.45
1.0–1.9 mm	17 (28%)	13 (22%)	—
≥2 mm	13 (20%)	9 (15%)	—
At 6 months			
No. of patients	56	57	—
METs attained during exercise	11.2 ± 3.2	12.2 ± 3.5	0.09
Pressure-rate product	258 ± 65	251 ± 50	0.61
ST-segment depression with exercise			
0–0.9 mm	25 (44%)	26 (46%)	0.22
1.0–1.9 mm	14 (25%)	14 (25%)	—
≥2 mm	17 (31%)	17 (29%)	—

advisable. We intended to do 1 interim and 1 final analysis, i.e., 2 analyses of outcome. This leads to a 2-sided confidence level of 0.95 at each of the 2 analyses with Bonferroni's adjustment. If the incidence of adverse reactions with conventional treatment is assumed to be 5% and if we wish to be able to detect an increase to 15% with the new treatment, then 153 patients in each arm would be required using a power of 80%. We intended to perform the first analysis after 150 patients had been recruited. If there was no significant difference at this stage, the trial would have been continued until the full complement of 300 to 400 patients had been recruited or the time limit for the research funding had been reached.

Termination of trial: Recruitment of patients for the trial was terminated 7 months before cessation of funding for the trial to allow 6 months of follow-up for the final patient who was recruited.

Patients' clinical characteristics are presented in Table 1. The 2 groups were well matched. In the ERNA group, 3% of patients had previous coronary artery bypass grafting and 3% had previous coronary angioplasty. No patient in the conventional treatment group had previous revascularization. Intravenous streptokinase was used as the thrombolytic agent in 46% of patients in the ERNA group and in 52% of patients in the conventional treatment group. Intravenous tissue plasminogen activator was used in 16% of patients in the ERNA group and in 14% of patients in the conventional treatment group. There was no difference between groups in the type of thrombolytic agent used ($p = 0.7$). One patient in the ERNA group had primary angioplasty for AMI (contraindication to thrombolysis), whereas no patient in the conventional treatment group had primary angioplasty. An area of left ventricular dyskinesia was noted on the 1-week GHPS in 3% of patients in the ERNA group and in 6% of patients in the conventional treatment group. This difference was not significant ($p = 0.4$).

Variables that were recorded during the predischarge exercise test are listed in Table 2. There was no significant difference between groups.

Follow-up: All patients were followed for 6 months by the nurse coordinator and a coordinator from the Health Economics Centre. All patients in the ERNA group were contacted over the telephone once a week for 5 weeks by the nurse coordinator. Patients in the conventional treatment group had regular contact with the staff of the cardiac rehabilitation unit during their 5-week cardiac rehabilitation program. Patients who did not attend the program on a regular basis were contacted over the telephone by the nurse coordinator. At the time of randomization of patients, a letter was sent to their primary care physicians and cardiologists that described in detail the nature of the trial. The contact telephone number of the nurse coordinator was included in the letter, with a request to be contacted in case

Table 3
Regular medications taken by patients at randomization and six months after acute myocardial infarction

Medication	At Discharge (n = 142)			At 6 Months (n = 113)		
	ERNA Group (n = 72)	Conventional Group (n = 70)	p Value	ERNA Group (n = 56)	Conventional Group (n = 57)	p Value
β Blockers	31 (43%)	29 (41%)	0.84	13 (24%)	21 (37%)	0.23
Aspirin	70 (97%)	66 (94%)	0.98	46 (82%)	56 (99%)	0.37
ACE inhibitors	12 (17%)	18 (26%)	0.19	10 (17%)	15 (27%)	0.38
Calcium channel blockers	11 (15%)	9 (13%)	0.68	14 (25%)	12 (21%)	0.43
Nitrates	16 (22%)	17 (24%)	0.77	16 (28%)	15 (27%)	0.53
Cholesterol-lowering agents	8 (11%)	9 (13%)	0.2	18 (33%)	15 (27%)	0.04
Diuretics	4 (6%)	2 (3%)	0.56	2 (3%)	4 (7%)	0.45
Antihypertensives	2 (3%)	1 (1%)	0.58	1 (2%)	2 (4%)	0.37
Antidiabetic medications	6 (8%)	7 (10%)	0.13	4 (7%)	6 (10%)	0.27

ACE = angiotensin-converting enzyme.

Table 4
Dietary patterns of patients at randomization and six months after acute myocardial infarction

Adherence to Low-Cholesterol, Low-Fat Diet	At Randomization (n = 142)			At 6 Months (n = 113)		
	ERNA Group (n = 72)	Conventional Group (n = 70)	p Value	ERNA Group (n = 56)	Conventional Group (n = 57)	p Value
Never	32 (44%)	48 (68%)		0 (0%)	6 (10%)	
Sometimes	7 (10%)	4 (6%)	0.02	9 (15%)	5 (9%)	0.1
Most of the time	17 (24%)	6 (9%)		22 (40%)	14 (25%)	
Always	16 (22%)	12 (17%)		25 (45%)	32 (56%)	

of doubts regarding the trial or to be notified in case of significant clinical events. An assessment was made of the patients at 6 weeks and at 6 months at the cardiac rehabilitation unit. Usually, there was no contact by the nurse coordinator with the patients from 6 weeks to 6 months and patients were encouraged to contact their primary care physicians and/or cardiologists in case of medical problems.

Assessment at 6 weeks: All patients were reviewed at 6 weeks at the cardiac rehabilitation unit. They were interviewed by the nurse coordinator and an assessment was made regarding their diet, exercise, smoking, and general well-being. Non–English-speaking patients were interviewed with the assistance of an interpreter. All patients had their weight checked. A symptom- and sign-limited exercise test was performed using Bruce's protocol. Serum cholesterol and triglyceride assessments were performed.

Assessment at 6 months: All patients were reviewed at 6 months at the cardiac rehabilitation unit. Assessment was done as at 6 weeks, and a GHPS was also arranged for each patient, with scans being analyzed in a blinded fashion by an independent nuclear medicine specialist.

Results

Follow-up of patients: All patients included in the trial were discharged from the hospital without any complicating events, and no patient needed revascularization during that time. By 6 weeks, 10 patients (14%) in the ERNA group and 10 (14%) in the conventional treatment group had dropped out of the trial. By 6 months, 16 patients (22%) in the ERNA group and 13 (19%) in the conventional treatment group had dropped out of the trial.

Occupation of patients: There was no difference between groups ($p = 0.29$) in the percentage of patients in paid employment at the time of the AMI. Sixty-five percent of patients in the ERNA group and 55% of patients in the conventional treatment group were in paid employment at the time of the AMI. There was no significant difference in the number of hours per week of paid employment between groups (38 hours/week in the ERNA group and 35 in the conventional treatment group, $p = 0.78$). There was also no difference in the number of hours per week of unpaid employment between groups (16 hours/week in the ERNA group and 14 hours/week in the conventional treatment group, $p = 0.21$). The approximate numbers of METs required for each patient's usual employment were estimated at 4.3 ± 1.6 for the ERNA group and 4.1 ± 1.7 for the conventional treatment group ($p = 0.6$).

Social situation: Seventy-seven percent of patients in each group were married at the time of the AMI. More patients in the ERNA group (97%) were living with ≥ 1

Table 5
Events zero to six months after acute myocardial infarction

	ERNA Group (n = 56)	Conventional Group (n = 57)	p Value
Death	0 (0%)	0 (0%)	—
Reinfarction	1 (2%)	3 (6%)	0.18
Cardiac failure	0 (0%)	0%	—
Spontaneous ventricular arrhythmias	0 (0%)	0%	—
Coronary artery bypass grafting	6 (10%)	2 (3%)	0.08
Percutaneous transluminal coronary angioplasty	4 (7%)	5 (9%)	0.79

other person at the time of the AMI compared with the conventional treatment group (84%, p = 0.02).

Regular medications: There was no significant difference between groups in the usage of regular medications at the time of randomization (Table 3).

Dietary patterns: At the time of randomization, there was a larger number of patients (p = 0.02) in the conventional treatment group who never adhered to a low-cholesterol, low-fat diet than in the ERNA group (Table 4).

Events: There was no significant difference in events between groups (Table 5). There was no mortality, heart failure, or spontaneous ventricular tachyarrhythmia during the 6-month follow-up.

Left ventricular function: There was no significant difference between groups in left ventricular ejection fraction or incidence of new left ventricular dyskinesia at 6 months (Table 6).

Exercise tests after AMI: At 6 weeks, patients in the conventional treatment group attained a significantly larger number of METs at exercise testing than patients in the ERNA group (Table 2). Otherwise, there was no difference between groups during exercise testing at 6 weeks and there was no difference between groups at 6 months (Table 2).

Utilization of health care resources: There was no difference between groups during follow-up in the number of visits to the primary care physician (p = 0.61), visits to a specialist doctor (p = 0.35), hospital admissions (p = 0.11), telephone calls (p = 0.10), exercise stress test (p = 0.72), GHPS (p = 0.5), or other diagnostic tests (p = 0.37).

Body mass index: There was no significant difference in body mass index between groups at 6 weeks or at 6 months (Table 6). However, there was a significant (p = 0.005) difference between groups in the within-patient change over 6 months. Body mass index in the ERNA group increased by 0.6 ± 1.4 kg/m^2 (p = 0.005) and that in the conventional treatment group decreased by 0.3 ± 1.8 kg/m^2 (p = 0.19).

Serum cholesterol and triglyceride levels: Serum cholesterol and triglyceride levels were significantly higher at 6 weeks in the ERNA group than in the conventional treatment group (Table 6). However, at 6 months, there was no significant difference. Within-patient change over 6 months in serum cholesterol and triglyceride were as follows: serum cholesterol decreased by 0.24 ± 1.2 mmol (p = 0.15) in the ERNA group and by 0.27 ± 1.4 mmol (p = 0.17) in the conventional treatment group. Serum triglyceride increased by 0.01 ± 1.3 mmol (p = 0.98) in the ERNA group and decreased by 0.4 ± 1.1 mmol (p = 0.02) in the conventional treatment group. There was no significant difference between groups in these changes over 6 months.

Table 6
Assessment at six weeks and six months after acute myocardial infarction

	ERNA Group	Conventional Group	p Value
At 6 weeks			
No. of patients	62	60	—
Cholesterol			
mmol	5.7 ± 1	5.2 ± 0.9	0.019
mg/dl	220 ± 39	201 ± 35	
Triglycerides			
mmol	2.8 ± 1.5	2.0 ± 1.4	0.01
mg/dl	248 ± 133	177 ± 124	
Body mass index	28.4 ± 3.6	28.4 ± 4.5	0.3
Percentage of patients smoking	26%	16%	0.14
No. of cigarettes smoked per day	10.6 ± 5.7	14.6 ± 14.6	0.9
Hours per week of home exercise	3.3 ± 2.8	4.4 ± 2.5	0.003
At 6 months			
No. of patients	56	57	—
Cholesterol			
mmol	5.6 ± 1.1	5.5 ± 1	0.68
mg/dl	217 ± 43	213 ± 39	
Triglycerides			
mmol	2.3 ± 1.1	2.1 ± 1.1	0.28
mg/dl	204 ± 97	186 ± 89	
Body mass index	28.5 ± 4	28.1 ± 4.3	0.48
Percentage of patients smoking	20%	19%	0.98
No. of cigarettes smoked per day	13.6 ± 8.1	15.9 ± 13.2	1.0
Hours per week of home exercise	2.5 ± 2.1	3.1 ± 2.5	0.12
Left ventricular ejection fraction (%)	51.2 ± 9.2	56.0 ± 8.2	0.71
New left ventricular dyskinesis	8%	10%	0.88

Smoking: There was no difference in the incidence of smoking or the number of cigarettes smoked between groups at 6 weeks or 6 months (Table 6). Within-patient decrease in smoking over 6 months was significant in the 2 groups (p <0.001). In the ERNA group, 31% of patients stopped smoking since their AMI and abstained from cigarettes over 6 months compared with 33% in the conventional treatment group. The mean number of cigarettes smoked decreased by 14.3 ± 11.9 (p <0.001) in the ERNA group and by 17.9 ± 17.6 (p <0.001) in the conventional treatment group. There was no difference between groups in this change over 6 months (p = 0.5).

Exercise at home: At 6 weeks, patients in the conventional treatment group were doing more exercise at home (4.4 ± 2.5 hours/week) than patients in the ERNA group (3.3 ± 2.8 hours/week); at 6 months, there was no significant difference between groups (Table 6). Within-patient change over 6 months was significant in the 2 groups ($p = 0.019$): patients in the ERNA group were doing 0.9 ± 2.5 hours more per week at 6 months compared with before the infarction ($p = 0.006$), whereas those in the conventional treatment group were doing 2.0 ± 2.7 hours more per week at 6 months compared with before the infarction ($p < 0.001$).

Diet: There was a significant ($p < 0.001$) change in the dietary patterns of the 2 groups over 6 months after randomization (Table 4). The percentage of patients who adhered to a low-cholesterol, low-fat diet increased in the 2 groups over 6 months. However, there was no significant difference between groups in dietary patterns at 6 weeks or at 6 months ($p = 0.1$).

Discussion

This randomized controlled trial showed that patients who were stratified before discharge to be at a low risk for future cardiac events after an AMI were advised to return at 2 weeks to full normal activities, including work. This advice resulted in an earlier return to work. The accelerated return to full normal activities resulted in no obvious adverse effects by 6 months. Consistent with our risk stratification, no patient included in the trial experienced death, heart failure, or spontaneous ventricular arrhythmia. Accelerated return to normal activities did not increase reinfarction or the need for revascularization and did not affect left ventricular function. Returning to work sooner is likely to be particularly important to patients who are self-employed and those in casual employment, and is likely to have significant socioeconomic implications. The lack of formal cardiac rehabilitation in patients who had an accelerated return to normal activities made no difference in risk factors or exercise test performance at 6 months compared with patients who had formal rehabilitation.

Other studies have assessed return to work after an AMI. From 1982 to 1984, the median time of return to work after a myocardial infarction was 2.27 months.[14] Dennis et al[3] and Picard et al[2] assessed the feasibility of early return to work in low-risk patients after AMI and were able to get patients back to work at 51 days after an uncomplicated AMI. Early return to work after AMI resulted in considerable cost benefit. Topol et al[1] assessed the effects of hospital discharge at 3 versus 7 to 10 days after myocardial infarction. In the early discharge group, 25 of 29 patients (86%) who were previously employed returned to work with full resumption of duties 40.7 ± 21.9 days after hospital admission compared with 25 of 27 (93%) in the conventional discharge group, who returned to work 56.9 ± 30.3 days after admission.

In our study, 371 patients had a predischarge exercise test using Bruce's protocol 1 week after AMI. No patient developed complications. This was in keeping with a study by Senaratne et al,[15] which showed that most patients after an AMI could have an exercise test using Bruce's protocol safely, with a very low incidence of complications.

There was an obvious benefit from cardiac rehabilitation at 6 weeks, but this benefit was not apparent at 6 months. Patients who underwent the standard rehabilitation program and returned to full normal activities, including work at 6 weeks after AMI, attained significantly greater METs at exercise testing, had lower serum cholesterol and triglyceride levels, and were exercising for more hours at home than patients who returned to full normal activities at 2 weeks without a formal rehabilitation program. A case could be made for more flexible scheduling of rehabilitation programs so that early return to work and attendance at a cardiac rehabilitation program are not mutually exclusive. The short-term benefit of rehabilitation was not sustained and may reflect a failure of standard cardiac rehabilitation to maintain the early benefits for the long term.

A meta-analysis by O'Connor et al[16] of 22 randomized trials demonstrated a 20% decrease in overall mortality from rehabilitation programs with exercise after AMI. The benefit of cardiac rehabilitation on mortality is not clear for patients who are at a low risk for cardiac events, as was the case in our study.

We found no deleterious effect of accelerated return to normal activities after an AMI on left ventricular function. Consistent with our findings, Rowe et al[17] reported in 24 patients that vigorous mobilization of low-risk patients from the fourth day of AMI did not affect left ventricular function and volumes. A primarily home-based exercise program after an AMI has been shown to be beneficial to left ventricular volumes and left ventricular ejection fraction.[18] Ehsani et al[19] showed that exercise training of progressively increasing intensity can improve left ventricular contractile function in some patients with coronary artery disease. This improvement seemed to reflect a decrease in the severity of myocardial ischemia. Froelicher et al[20] reported a modest change in myocardial perfusion and function in a select group of patients who underwent an exercise program that lasted 1 year after AMI. However, others have reported no effect of exercise training on left ventricular ejection fraction after AMI.[21,22]

It is well established that patients who attain only a low workload on exercise testing after an AMI have a high risk of subsequent cardiac events compared with patients who attain a good workload. Hung et al[23] and Sullivan et al[24] reported that a peak workload of ≤4 and <5 METs, respectively, on exercise testing 1 to 3 weeks after an AMI identified patients who were at high risk for subsequent cardiac events.[23,24]

It has been demonstrated that the combination of a predischarge electrophysiologic study and symptom-limited exercise testing is a very effective method of predicting

subsequent cardiac events.[9] In that study, 62% of survivors of AMI had <2-mm ST-segment depression on exercise testing and no inducible ventricular tachyarrhythmia at electrophysiologic studies. The mortality in this group was only 1% during 1-year follow-up.

Appropriate risk stratification after an AMI can identify patients who are at low risk for future cardiac events. Patients who are identified to be at a low risk for future cardiac events can be offered the option of returning to full normal activities, including work at 2 weeks after myocardial infarction. Appropriate education and counseling before discharge will be important in such patients to ensure adequate risk factor modification. However, before this strategy can be widely recommended, its safety must be confirmed in larger prospective clinical trials.

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